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ARTHRITIS

MEDICAL TREATMENT AND HOME CARE

John H. Bland, M.D.

Illustrated by George Daly

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Dedicated to
Mr Max Quinn *and* Mr Richard Cutting,
good friends and loyal patients

FOREWORD

Dr Bland has earned congratulations and thanks from all arthritics for this timely monograph on diseases of the joints He brings to the task a background of wide experience and important contributions in the field of rheumatology, and a training which fits him well for such an endeavor

Both laymen and physicians have attempted to write a popular treatise on arthritis, but they all lack to some extent the voice of authority Dr Bland has succeeded in striking this note, and all who read his book will sense it at once

Dr. Bland realizes, as every physician should, that a large part of success in handling the arthritic patient is centered in home care Arthritis is not an easy disease to treat It takes much patience on the part of physician, patient, and family to achieve favorable results Furthermore, good home care comprises a proper balance between rest and exercise, and Dr Bland has been explicit regarding the latter Any patient who will conscientiously follow the exercise programs as set forth in this book will surely profit by them.

Dr Bland's discussion of quacks and quackery in the treatment of arthritis should be required reading for all arthritics If the patient with a rheumatic ailment absorbs this information he will save himself much money, time, and discouragement

This book could be read with profit by physicians as well as lay-

men Many doctors take a rather casual attitude toward treating this group of diseases Here the family physician will find everything set down in an orderly and systematic way which will aid him in arranging a program of treatment for the patient.

I am glad Dr. Bland stressed research as so vital in the war against arthritis Thanks to several agencies, a considerable amount of medical investigation is now going on in this country and abroad and much more will be forthcoming in the future.

RUSSELL L CECIL, M D

PREFACE

The greatest challenge in the health field today is arthritis and rheumatism. Although these diseases are the oldest known to man, they are also until the past decade the most neglected. It is a paradox of medical history that, though arthritis is the most ancient disease of man and animals, rheumatology, the study of rheumatism and arthritis, is one of the newest branches of medical science. It is only in the past few years that the tremendous importance and magnitude of the health problem of rheumatism and arthritis have been appreciated. It is now attacked by physician investigators, basic scientific researchers, government public health agencies, and voluntary lay health organizations. It is only recently known that somewhere between seven to eleven million people in the United States are presently suffering from some form of arthritis or rheumatism. Rheumatology is at long last coming of age, a rheumatic renaissance is in full swing.

Even though a mounting wave of research effort seeking cause and cure is in progress, neither is yet available. However, modern

treatment of arthritis is very effective in curbing the ravages of these diseases, decreasing crippling and deformity. *This fact is not generally appreciated* It is unfortunately often presumed that because there is no cure, treatment is unsatisfactory. This is far from the truth Any physician with some experience in rheumatic disease commonly observes that the properly educated, strongly motivated patient who thoroughly learns the *comprehensive home care program** and carries it out daily returns to a state of health compatible with reasonable freedom from pain and control of crippling and deformity, and is thus able to keep his job and produce income

Rheumatoid arthritis and osteoarthritis are two chronic diseases for which more can be done than any other comparable disorders in the chronic disease category It is wisdom for the patient with arthritis to accept the issue that there is no cure, and then to devote himself to the application of the very best treatment available Fortunately this is readily obtained, is inexpensive, and can be well accomplished at home. The aim of this book is to provide the patient and his family with necessary knowledge and techniques for successful treatment of arthritis No available cure exists, but the vigorous and continuous use of the comprehensive home care program leads to diminution of crippling, slow decline of joint swelling and pain, *increased ability and decreased disability*

The most important and required demands in the treatment of arthritis are· (1) education about the nature and characteristics of the disease; and (2) the learning of concepts and techniques of treatment There is much misinformation disseminated concerning rheumatic diseases. Both the patient and his family need a thorough and honest description of the disease itself as well as its treatment

No matter what the duration or severity of the disease, there is justified hopefulness for any arthritis patient. He now works effectively and knowledgeably with his physician. He has considerable

* See Chapter 1

insight into the nature of his disease He is able to measure and observe progress He accepts the limitations of the several aspects of treatment and is realistically appraised of his chances of recovery and the magnitude to which he may return to a useful and productive life Treatment is always individualized, there is no stereotyped form

It is impossible for the best and most communicative physicians to tell even the bare outlines of the arthritis story to all their patients, this book is written to fulfill that need It is to be used by physicians and patients and their families The family makes a very important contribution to the comprehensive home care program

INCIDENCE AND ECONOMIC IMPORTANCE OF ARTHRITIS AND RHEUMATISM

The importance of the arthritis and rheumatism problem is attested by the estimated seven to eleven million Americans currently afflicted with some form of these diseases, thus approximately one person in twenty in the population is so affected * Wholly apart from the inestimable human suffering and disability, the United States Public Health Service estimates that arthritis and rheumatism cost the nation over 1,500,000,000 dollars a year in wages of arthritics who cannot work, 1,200,000,000 dollars lost per year, money to support and maintain arthritics is estimated at 125,000,000 dollars yearly, and, lastly, a yearly loss to the government of 195,000,000 dollars, potential income tax, due to unemployability †

In recent statistical studies in the United States arthritis and rheumatism were shown to cause more years of disability than all types of accidents † A reliable estimate was made of total days

* Hollander, J L, and Brown, E M, Jr "Diagnosis in the Arthritides," [illegible]

ton, D C, 1953

lost from work and approximate cost in medical care per year an estimated 97,200,000 work days are lost at a medical care cost of 1,000,000,000 dollars per year.* Study of an American industry employing 25,000 people disclosed that 4200 work days were lost each year due to rheumatic diseases †

Table 1 illustrates the estimated prevalence of chronic diseases in the United States in the order of their frequency of occurrence.

Table 2, from the same study, shows the estimated annual number of days lost from work or other usual pursuits because of chronic diseases, the list is in decreasing order of the number of days lost.

The most recent extensive and intensive survey to determine prevalence of rheumatism in the United States was conducted by a canvassing interview method surveying 25,000 households scattered over the country in 68 sample areas including 42 states It was estimated that there are about 10,104,000 people 14 years of age or over in the United States who believe they have arthritis or rheumatism. The actual figure is probably much larger. This is an estimated 9 3 per cent of the population. An estimated 6,404,000 or 5 9 per cent of the population had been told by their doctor that their condition was arthritis or rheumatism. Twenty-five per cent of the 10,104,000 people had made some change in their work or usual activities because of their "rheumatism."‡

In a Health Inquiry Hearing before the Committee on Interstate and Foreign Commerce of the House of Representatives, the highest authorities stated that arthritis and related rheumatic disease are more prevalent among our citizens than are cancer, heart disease, tuberculosis, and diabetes combined. In the United States it affects more people, cripples and disables more people, and brings more pain than any other chronic disease It disables ten

* Committee of the American Rheumatism Association "Primer on the Rheumatic Diseases," *Journal of the American Medical Association*, 152:323 (May 23), 405 (May 30), 552 (June 6), 1953

† Bunim, J J "The Incidence of Rheumatic Diseases in Industry," *Industrial Medicine and Surgery* 22 302, (July) 1953

‡ Woolsey, T D "Prevalence of Arthritis and Rheumatism in the United States," *Public Health Reports*, 67:505, (June) 1952

TABLE 1*

Estimated Prevalence of Specified Chronic Diseases in the United States (1937)

Disease	*Number of Cases*
RHEUMATISM	6,850,000
Heart disease	3,700,000
Arteriosclerosis and high blood pressure	3,700,000
Hay fever and asthma	3,450,000
Hernia	2,100,000
Hemorrhoids	2,000,000
Varicose veins	1,750,000
Chronic bronchitis	1,700,000
Nephritis and other kidney diseases	1,550,000
Nervous and mental disorders	1,450,000
Goiter and other thyroid diseases	1,200,000
Sinusitis	1,150,000
Cancer and other tumors	930,000
Diseases of the female organs	720,000
Tuberculosis, all forms	680 000
Diabetes mellitus	660,000
Diseases of the gallbladder and liver	640,000
Other diseases of the circulatory system	440,000
Chronic tonsillitis and other throat disorders	380,000
Ulcers of the stomach and duodenum	330,000
Diseases of the bladder and urethra	270,000
Chronic diseases of the skin	270,000
Anemia	240,000
Chronic appendicitis	170,000
Chronic diseases of the eye	150,000
Chronic diseases of the ear	100,000
Chronic pleurisy	90,000
Diseases of the prostate and male genitourinary organs	80,000

* National Health Survey of the United States Public Health Service, Bulletin 6, Sickness and Medical Care Series, United States Treasury Department, 1938

TABLE 2*

Estimated Annual Number of Days Lost from Work or Other Usual Pursuits by Reason of Specific Chronic Diseases (United States, 1937)

Disease	*Annual Number of Days Lost*
Nervous and mental disorders	132,500,000
RHEUMATISM	97,200,000
Heart disease	95,200,000
Arteriosclerosis and high blood pressure	56,900,000
Tuberculosis, all forms	41,400,000
Cancer and other tumors	36,300,000
Nephritis and other kidney diseases	28,400,000
Diseases of the female organs	26,800,000
Hay fever and asthma	21,900,000
Diseases of the gallbladder and liver	20,000,000
Diabetes mellitus	19,200,000
Ulcers of the stomach and duodenum	13,600,000
Hernia	13,600,000
Chronic diseases of the skin	10,300,000
Anemia	8,500,000
Diseases of the bladder and urethra	8,200,000
Chronic bronchitis	8,000,000
Chronic appendicitis	7,600,000
Goiter and other thyroid diseases	7,600,000
Other diseases of the circulatory system	6,600,000
Sinusitis	6,000,000
Varicose veins	5,900,000
Chronic tonsillitis and other throat infections	5,400,000
Hemorrhoids	5,100,000
Chronic pleurisy	4,200,000
Chronic diseases of the eye	4,200,000
Chronic diseases of the ear	3,300,000
Disease of the prostate and male-genitourinary organs	3,300,000

* National Health Survey of the United States Public Health Service, Bulletin 6, Sickness and Medical Care Series, United States Treasury Department, 1938

times as many persons as diabetes, ten times as many as tuberculosis, and seven times as many as cancer. The approximate 7,500,000 to 10,000,000 people with arthritis or rheumatism in the United States is a number greater than the combined populations of several large U S cities One million of the 10,000,000 have been permanently disabled. Counting the families of arthritics, at least 30,000,000, or one fifth of the population of the United States, are affected by the medical, social, and economic aspects of this group of diseases *

Because these diseases cripple and disable but generally do not kill, they are most important, deserving highest priority in research and treatment, among the chronic diseases they are of pre-eminent economic and social importance The rheumatic diseases constitute a great scientific and humanitarian challenge, presently being answered in force

THE PRESENT AND FUTURE OF ARTHRITIS AND RHEUMATISM

In the past ten years there has occurred a vigorous build up of effort in research and practical treatment of rheumatic disease There is much hope as well as help for the arthritic today Arthritis no longer stands at a stalemate The war against rheumatism is at full tilt Our universities and health centers have effective research programs investigating basic causes, clinics to treat arthritics have burgeoned all across the country (see Appendix III, pp 187-201)

The recent accelerated battle against rheumatism followed a gradually increasing interest in rheumatic disease over the past 40 ears Prior to that there was little or only sporadic activity Millions f Americans presently suffering from arthritis and rheumatism are o longer passive and silent. They live in a scientific renaissance

* Health Inquiry Hearing before the Committee on Interstate and Foreign mmerce, House of Representatives, Eighty third Congress, First Session on uses Control, and Remedies of the Principal Diseases of Mankind, Part 2, 5, 7, and 8 1953 United States Government Printing Office, Washing D C, 1953

and know it, future prospects are hopeful. Arthritics have an enlightened new self-interest; they demand and now find sympathetic, understanding, informed physicians.

So evident is the importance of control of these diseases to the individual, to the nation, and to the world that no more need be said. It is most unfortunate that so much can be done in prevention and active treatment—*and so little actually is done.* It is hoped and believed that utilization of the comprehensive home care program under the supervision of a competent physician can and will reduce the serious consequences of these diseases.

il L. Cecil, M D

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Russell is much appreciated. Mr. W. Holt Seale and Mr. Valery H. Webb have been very helpful, resulting in ideal publisher-author relationship.

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ARTHRITIS

Medical Treatment and Home Care





Chapter 1

GOALS AND HOW TO ACHIEVE THEM

While waiting for the discovery of a "cure" many arthritics are suffering progressively more damage and disability. This is tragic and unnecessary since very effective treatment is available and at hand. This book is written in the belief that modern treatment of most types of arthritis is very effective, capable of restoring health and controlling disabling consequences of these diseases. Despite adequate available treatment many people with arthritis and other rheumatic diseases receive either suboptimal treatment, or none at all.

Success of treatment depends, first, on a patient who wants to improve; second, on education of the patient and his family into the nature of his illness; third, on utilization of many simple, effective techniques of management; and, fourth, a well-informed and enthusiastically interested physician. Hospitalization may be

necessary for purposes of diagnosis as well as training for a comprehensive home care program. The most important methods of treatment are inexpensive, and accomplished at home, *indeed, plain rest, selectively and individually prescribed, may be and often is the most important part of the treatment program.* The arthritic should know that his arthritis can be controlled.

This book's goal is to provide the patient and his family with instruction into the nature of arthritis and its management at home Physician supervision is essential. However, ultimate responsibility for administering home treatment belongs to the patient Nowhere does the "do it yourself" trend find more application than in the treatment of arthritis. *This explicitly means "do it yourself" only with frequent professional guidance*

Cure in the sense of complete elimination of the disease is not available, but *effective, preventive, restorative treatment is here and now.* To illustrate, I'd like to tell a story of a man who built a home on the side of a mountain in Vermont He found when the house was completed that the cellar was filled with water most of the time The drain-off from rain and melting snows cascaded down the mountain and poured into his cellar. He was discouraged, ready to give up his plan of many years to live on the mountain. Several people studied his problem to no avail He was told that it was *incurable* Rain and snow cannot be *turned off* in season His advisers and consultants were right. The *disease was incurable*

If it cannot be cured, he thought to himself, perhaps I *can* render it *noninjurious* to me. He dug a trench higher up on the mountain down to a point 100 yards behind his house. Two diverting trenches were then dug around his house. The drain-off came down this system, detouring his house. The cellar was dry and the problem solved But the fundamental defect was unchanged The disease still existed, incurable However, it did no further harm, his house stood, and he enjoyed it from then on.

This is the situation in the commonest rheumatic diseases Cure is not yet possible, the disease cannot yet be eliminated Treatment,

however, is very effective, the disease is rendered noninjurious, and crippling is often prevented This book provides instruction in the history and antiquity of arthritis, the natural course and expected trend of the disease, certain common frauds and hoaxes concerning arthritis, and, most importantly, the means of successfully treating it at home It is clearly supplementary to the physician's advice and counsel

THE COMPREHENSIVE HOME CARE PROGRAM

The comprehensive home care program is what this book is mainly about, it is an assembly of all means of treatment of arthritis which have been found, over a period of many years, to be regularly and predictably effective in controlling and diminishing the damage this disease causes The comprehensive home care program is applicable to the two main rheumatic diseases, rheumatoid arthritis and degenerative joint disease Both are diseases for which there is no cure, they are also diseases for which effective treatment presently exists. The patient and his family must have an understanding of the concept of achieving successful treatment in an incurable disease. One day, cure will surely become available Until that time techniques and methods are at hand to prevent the disabling consequences of these diseases

In rheumatoid arthritis and degenerative joint disease (as in most incurable diseases) there have appeared from time to time a number of forms of treatment It is so easy to assume a cause and effect relationship between some treatment measure and improvement in such diseases. Evaluation of treatment is especially difficult in rheumatoid arthritis because the untreated disease fluctuates in a regular pattern of improvement and regression The relatively few basic researchers and physician scientists who have observed the natural behavior of rheumatoid arthritis over a sufficient period of years have all noted that *there are certain treat-*

ment measures and methods which do regularly and predictably favorably influence the course of rheumatoid arthritis.

The purpose of the comprehensive home care program is to control and suppress these diseases There is no short cut. In the light of present knowledge one cannot safely use any single form of treatment, rather by application of a combination of factors, all helping in varying degree, these diseases and their serious inroads on health are controllable, in most instances the disease can be made to regress. There is no patient who cannot be helped, *no matter how long he has had his disease or how severe it has been*

This program is prescribed by a physician. The magnitude of treatment (the techniques used, *the time devoted to rest*, exercises, heat, massage and other physical therapeutic measures) varies from one time to another in the same individual, depending upon the intensity of the arthritis. The drug treatment is also variable from time to time This means that physician visits and re-evaluation are necessary, the frequency of visits depends on progress made, phase and severity of the disease, and the ability of the patient and his family to carry out the treatment. It cannot be overemphasized that *treatment* in both these diseases *is individualized*, there can be no stereotyped plan with any hope of successful control

An important and much neglected aspect of the comprehensive home care program is education of the patient and his family regarding the nature and characteristics of arthritis. This implies that the patient needs to know about his disease, why he is carrying out certain treatments, what he can expect from them, how he can measure his progress; all contribute very significantly to suppression of the disease and relief of symptoms. The patient must know that he cannot see progress in terms of days and weeks, but rather in months and years. This requires an understanding *of the long-term nature of arthritis. People fear what they don't know, infinitely more than what they do know.* When the patient with rheumatoid arthritis has a thorough knowledge

of what his problem is and how to solve it, he has taken a big step toward success in treatment

To evaluate progress the patient and his family must both know that rheumatoid arthritis is better and worse alternately, in this fluctuating pattern Thus, if one happens to be using a particular type of treatment when he is improving (in the natural course of his arthritis), he is apt to give false credit to whatever treatment he was using This is why fraud and hoaxes in treatment have flourished so abundantly in the arthritis area To really know arthritis is to avoid loss of time, money, and morale Time wasted in fruitless treatment is precious time lost in which real progress could have been made in influencing the underlying inflammatory process in the connective tissues

The patient should know the long history of arthritis, the dark ages of rheumatism It is most encouraging to contemplate the past compared to the present in the fight against arthritis There is good reason to believe that knowledge of organizations and people throughout the world who are joined with the patient in a war against rheumatism plays a part in controlling the disease in the individual patient Such knowledge provides hope and inspiration

The role of the family is often underestimated All persons concerned with an individual patient's arthritis should study this book The more the interested family members know about the arthritis problem and how to manage it, the more successful will treatment be This is not an idle platitude, it is well established The patient, his family, and his physician constitute the team who administer and adjust the comprehensive home care program to individual needs from time to time as indicated Thus, the patient and his family must have specific knowledge of the disease itself and the methods of treatment They must realistically understand the limitations as well as the hope for progress

Physicians would be delighted if sufficient time were available to teach the arthritis story to patients and their families This is not possible because it would require many hours each week One large,

successful arthritis clinic in the United States adopted a program of holding regular classes for arthritis patients. A series of lectures with diagrams, picture slides, and movies teaches them about their disease, illustrating what is known about it and what physicians are doing in research and treatment. Both the patient and his family come to know the importance of their participation in the treatment program. Ideally, all arthritics should attend a series of such lectures. It is believed that this book can help fulfill a similar function.

An understanding of the role of rest in favorably influencing the abnormal connective tissues of arthritis patients is most important. The amount and type of rest vary from time to time. Both local and generalized rest are necessary. It is clear that rest is fully as important as medication, use of heat, and education. It is not clear whether rest acts directly on the chemical disorder in the connective tissues or on the inflammatory reaction, it is certain that the favorable effects are long lasting and have a fundamental effect on the arthritis process. This aspect of treatment is most liable to be taken lightly or to be misunderstood as not fundamentally contributing to recovery.

The use of many physical therapy methods is an important portion of the comprehensive home care program. The motivation *and philosophy with which the patient approaches this form of treatment constitute major factors in determining his success.* Methods are often applied daily, frequently a number of times daily, such are specifically prescribed and vary from patient to patient. Thorough understanding and perfection of these techniques are essential. Family, patient, and physician, all must understand that by the use of rest, heat, light, exercise, and massage the fundamental abnormality in the connective tissues of the arthritis patient is commonly improved.

These treatments are not given just to make the patient "feel better"—rather because they suppress the basic disease. The tendency is to underestimate efficacy of these measures. They do not

have any prompt or dramatic effect, but by virtue of their gradual, long term effects, success is achieved Patient and family frequently relax the program as improvement occurs This is unfortunate, since, when the patient is at his best, having the least pain, swelling, and limitation of motion, he can make the most progress in suppressing the disease more permanently and fundamentally Hence, the better one feels the more effective treatment may be.

Exercises are the treatment phase most likely to be neglected or dropped The well motivated patient who has a thorough grasp of the nature and magnitude of his problem realizes that even though exercises are a bore he really needs them, he may need them several times daily or only a few times weekly The patient must not select and do his own exercises Often joints are spared while muscles are exercised Exercises must be specifically prescribed or joint damage may result

Many patients with arthritis consider the drug treatment the most important aspect They look in vain for some pill, injection, or liquid mixture which will cure the disease Such does not exist Drug treatment, though important, is a relatively small part of the comprehensive home care program In the absence of the all-inclusive program drugs are largely ineffective *This fact is little appreciated*

In a disease with the characteristics of arthritis there inevitably appear many drugs for treatment Many are harmless, many may potentially do considerable harm, the most important and effective drug in arthritis treatment remains simple aspirin.

Drug treatment varies considerably from time to time in the course of the disease It is occasionally dropped altogether Patient and family should have a thorough awareness of what drugs are effective, why they are given, what effect they may have on the arthritis symptoms, occurrence of undesirable side effects, and how long they may be used This does not suggest that drugs are used without physician supervision, since such is essential

ARTHRITIS, PAST AND FUTURE

Attitudes and hopes of people with arthritis are vastly differen from those of a few years ago The tide has turned against several of the serious rheumatic diseases. The great killer, rheumatic fever, and the great crippler, rheumatoid arthritis, are no longer the relentlessly progressive and damaging diseases they once were Attitudes of physicians and arthritis researchers have been greatl altered Research is now done to determine cause. Before the turn of the century the great Sir William Osler wrote. "When an arthritic comes in the front door I want to go out the back door" If Osler could say this it is no wonder that thousands of lesser colleagues felt inadequate. At a time when cause was entirely unknown and treatment a blind stab, scientific people ignored arthritis It is uncomfortable to contemplate one's ignorance, the problem was swept under the rug in a defensive reaction. Arthritics were once victims of diet faddists, spine twisters, witch doctors, and other hoaxes Rheumatism, its victims, and its few sincere doctors were far out on the fringes of the medical world No research was done, hospital beds were not available to the chronic arthritic He used his hot-water bottle, took vaccine, rubbed himself with wintergreen and alcohol, ate aspirin or quinine. *This era is no more*

At the turn of the century rheumatism was shrouded in mysticism and indifference. The old print of 1809 (Fig 1) suggests ideas of an earlier time. This is far from the case today. Rheumatology, the study of rheumatic disease, although late in maturing is at last doing so There has been greater advance in knowledge and treatment of arthritis and rheumatism in the past 20 years than in the preceding 2000 years The once-forgotten rheumatic patient has working for him a host of people· doctors, research men, biochemists, immunologists, and other scientists all over the world Arthritis is now studied by such modern techniques and instru-

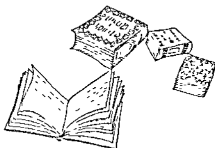


Figure 1 An old print of 1809

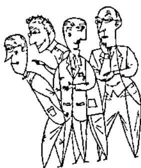
ments as animal experimentation, x-ray, blood tests, electron mi scopes, immunological and chemical examinations, isotopes a radioactive substances, phase-contrast microscopes, and x-ray d fraction

The problems of the rheumatic patient are no longer approached by nibbling at the edges, only attempting to make him more comfortable Efforts are vigorously and effectively directed at determining cause What is the underlying reason that connective tissues (muscles, ligaments, tendons, joints) become inflamed and painful? What occurs chemically in the tissues of the rheumatic patient? Why is the disease very severe in some people and mild in others? Why do some few seem to get completely well? These are questions asked, answers are beginning to appear Hereditary patterns are being extensively studied, and complicated biochemical research is being done The immunological response in arthritis is the most current and exciting avenue of research approach. Population surveys to determine incidence of arthritis and its causes are probably going to provide most urgently needed information With all this investigation, treatment has not been neglected Successful therapy is commonplace.

Cure cannot be promised as it now stands However, study of conquering of diseases in the past indicates that accurately designed and intelligently conducted programs relentlessly pursued to fixed objectives have a way of eliminating the disease attacked History is on the side of the optimist Cure is not in the "great by and by" but within our time The rheumatic horizon is indeed bright today







Chapter 2

WHAT ARE ARTHRITIS AND RHEUMATISM?

DEFINITIONS

Because it is important to know the meaning of certain words, the following definitions are offered The term "*arthritis*" was used in the days of Hippocrates, Old Testament times, the years 460 B C to about 380 B C It literally means inflammation of joints —hot, red, swollen, painful joints This meaning remains quite applicable today Any "inflamed" tissue is hot, red, tender, and swollen Thus, if a disease produces inflammation ("*itis*") in joints (*arthron*), it is an arthritis The word *arthritis* alone does not designate a disease but refers to the inflammation of a joint causing

aching, pain, swelling, and stiffness. There are many diseases that manifest arthritis as part of their symptoms and signs

Figure 2 shows what is seen if any joint is cut in cross section. The bone ends are capped by disks of dense, elastic cartilage, commonly called gristle. This has a smooth, glistening surface, allowing the joint ends to move smoothly over each other. The synovial

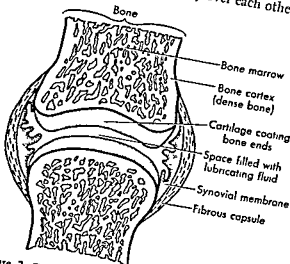


Figure 2. Diagram of what is seen when a normal joint is cut through. (*Osteoarthritis* Empire Rheumatism Council, Tavistock House [N], Tavistock Square, London WC-1, England)

membrane surrounds the joint and forms only a part of the lining. It blends with the tough, fibrous capsule enveloping the joint outside the synovial membrane. The capsule blends with a very ough membrane called the periosteum which is tightly adherent o bone. The tougher parts of the capsule are called the ligaments ensitive parts of the joint are in the capsule and ligaments, and it here that pain arises in disease or injury. Thus, the parts of a nt are bone, cartilage, synovial membrane, capsule, and joint

Six hundred years after Hippocrates, Galen (130 200 A D), the famous Greek physician, introduced the word "*rheumatism.*" The root word, *rheumatismos*, means a flux or discharge, a mucous or "evil" humor which was thought to flow from the brain to the joints and to other body cavities, producing pain Rheumatism then indicated pain resulting from discharge into body cavities of "humors" capable of inducing disease The several humors of the body were thought to be in balance in health and not so in disease Body cavities included those of the lungs, heart, abdomen, joints, and even the nose and throat (catarrh) It was thought that obscure humors "dropped" into body cavities producing disease. One arthritic disease, gout, was named for the Latin word, *gutta*, a drop * Gout was once used interchangeably with the term rheumatism. The word rheumatism was gradually limited to painful disorders of the joints, muscles, ligaments, tendons, and bones.

This useful, very old fashioned word "rheumatism" refers to a large, miscellaneous group of diseases and disorders involving, in small or great part, muscles and joints There are more than 40 such diseases The word, *rheumatism*, is used to denote the field of rheumatic disease Identification of the type of rheumatism (the particular disease) in question is often no easy matter It may occasionally tax the ingenuity of the specialist In general, however, identification of these diseases today is satisfactory

The word, *rheumatology*, is the name given to the study of rheumatic diseases Rheumatology has broad implications ramifying into all aspects of rheumatic disease—distribution in the world, education, research, human and animal, basic chemistry and physiology of normal and abnormal connective tissues, as well as diagnosis and practical management

Clarification of some medical terms is needed. Confusion exists regarding what an intern is as compared to an internist An intern is a young physician who has graduated from medical school after

* See pp 18 19

four years of study and is engaged in a year of hospital trainin before qualification for practice. An internist is a physician wh has graduated from medical school, served one year of internship and has had three to six years of specialized study and training in the field of internal medicine. This is a broad field with many specialties The internist is qualified in the broad field of internal medicine, he may have special interest and training in one or more subspecialties, of which rheumatology is one.

A rheumatologist is a physician with particular interest and special qualification in diagnosis and treatment of rheumatic diseases He may be a practitioner, a teacher, or a medical investigator, engaged largely in research. A rheumatologist, however, is well grounded in internal medicine with special interest and skill in rheumatic diseases

An ideal general practitioner is a physician working in the front line of medicine He examines and treats many more patients daily than the internist His work is in practically all types of disease. He does not usually do extensive and searching examinations. He performs minor surgical operations, looks after children, and may do a certain amount of obstetrics

GENERAL TYPES OF RHEUMATIC DISEASE

About 75 per cent of all rheumatism sufferers have either rheumatoid arthritis or osteoarthritis Osteoarthritis is better called degenerative joint disease. Until it is thoroughly advanced there is little inflammation. Rheumatic fever and gout produce acutely inflamed, hot, red joints

Many cases of arthritis are caused by common specific bacteria or germs They may invade joints and cause infection, and, hence, "arthritis" results For instance, the pneumococci, bacteria of pneumonia, may infect a joint making it hot and swollen, staphylococci, the common bacteria of skin infection (pimples), may infect a joint. Tuberculosis, although rarely today, causes arthritis of the

spine and hip Bacteria that cause gonorrhea may invade joints producing inflammation and arthritis, however, this is uncommon today since the primary disease is so well controlled The syphilis germ may involve joints resulting in destruction and arthritis Treatment with antibiotics is curative of most cases of acute "infectious arthritis" Rheumatic fever is associated with hot, red, painful joints but only for short intervals, hours to days More importantly rheumatic fever involves the heart and other muscles in addition to joints As someone has said, "Rheumatic fever bites the heart and licks the joints"

The major health problems in rheumatic disease are rheumatoid arthritis and degenerative joint disease (osteoarthritis) There is no specific treatment resulting in cure in either condition Degenerative joint disease is largely a benign disorder, treatment is effective and results predictable The majority of people who believe they have "arthritis actually have degenerative joint disease Fortunately, when recognized early, treatment prevents disability, and this disease does not seriously interfere with one's activities

Rheumatoid arthritis is a more serious inflammatory disease whose course is not as predictable Comprehensive treatment, however, exerts control over disabling effects of the disease, much can be done in the prevention of deformity, rehabilitation and restoration to function constitute an achievable end People today should not become crippled and disabled, this is often preventable Of all the rheumatic diseases, rheumatoid arthritis is the greatest problem Consequently it receives the maximum attention in research, preventive measures, and active treatment

LESS COMMON RHEUMATIC DISEASES

Besides rheumatoid arthritis and degenerative joint disease, there are many less frequent rheumatic diseases A committee of the American Rheumatism Association prepared a very usable classification This classification and the specific rheumatic disorders are

briefly discussed and identified in this section. Some do not specifically involve joints at all (nonarticular rheumatism) Many do involve joints, there are 35 different diseases associated with heat, redness, swelling, and limitation of motion of joints (arthritis). Thus, it is obvious that diagnosis is often quite difficult to accomplish, requiring considerable judgment and training It is quite hopeless for the patient to attempt to indulge in self-diagnosis in these disorders

In general, the majority of cases of rheumatic disease fall into eight important groups

1 Arthritis due to microbes, e g, viruses, bacteria, rickettsia, and fungi
2 Rheumatic fever
3 Rheumatoid arthritis
4 The collagen diseases
5 Degenerative joint disease (osteoarthritis)
6 Arthritis due to direct injury
7. Arthritis of gout
8 Nonarticular rheumatism, e g, bursitis, fibrositis, etc.

ARTHRITIS DUE TO MICROBES Infections of the joints may be caused by very common bacteria which gain access to joint tissues. The common streptococcal bacteria of sore throat or pneumococci of pneumonia may readily invade a joint causing arthritis The typhoid organism may cause joint infection The gonococcus of gonorrhea at one time was a very common joint invader. Certain viruses, fungi, and rickettsia, although very infrequently involving joints, occasionally do so The incidence of acute infectious arthritis has decreased markedly because the microbes causing joint infection are sensitive to sulfonamides and antibiotics, and early treatment prevents joint invasion

Undulant fever has occasionally produced arthritis Tuberculosis was once a common cause of arthritis but is rarely so now. Likewise

syphilis was once a fairly common cause of a joint disease (Charcot's joints), however, treatment of this disease is so satisfactory that such joint involvement is rarely seen today

RHEUMATIC FEVER Rheumatic fever is an acute or chronic inflammatory connective tissue disease usually preceded by a streptococcal infection in the throat The inflammation is spread throughout the connective tissues of many organs such as the heart, joints, body membranes and skin, resulting in rather acute disease It *occurs at all ages with the peak incidence between six and nine* years of age Theoretically rheumatic fever is quite preventable today by preventing streptococcal infections

RHEUMATOID ARTHRITIS See Chapter 5

THE COLLAGEN DISEASES The collagen diseases by name are disseminated lupus erythematosus, scleroderma (progressive systemic sclerosis), dermatomyositis, and periarteritis nodosa. These diseases are much more serious than others Diagnosis is often extremely difficult, particularly early in the disease. The cause is unknown They probably do not have a common cause. They are grouped together because the general change in the connective tissue as observed pathologically is similar Collagen is one of three fibrillar elements of the connective tissue, the other two are called reticulin and elastin * Although these diseases are named as a group, the collagen is not necessarily involved any differently than in some other rheumatic diseases This group name is considered inappropriate by most rheumatologists

Lupus erythematosus is a generalized systemic disease with variable symptoms and signs Eighty-five per cent of cases are in women The course fluctuates strikingly The cause is unknown, onset of the disease is often associated with exposure to sunlight, exposure to x ray, or unusual injury

Scleroderma is a systemic disease more common in middle life affecting women more frequently than men It is manifested mainly by thickening and extreme tightness of the connective

* See p 23

tissues of the skin The disease also produces changes in many organs throughout the body.

Dermatomyositis is also a systemic disease in which skin, muscles, and subcutaneous tissues are especially involved Its cause is unknown The skin usually shows thickening, swelling, and tightness. Muscles become swollen, tender, and very weak.

Periarteritis nodosa, although involving the connective tissue system generally, seems to affect more extensively the small blood vessels. No known cause has been discovered. It is more common in men than women

DEGENERATIVE JOINT DISEASE (OSTEOARTHRITIS). See Chapter 5.

ARTHRITIS DUE TO DIRECT INJURY. Either chronic, repeated minor injuries or acute severe injury to a joint or joints can produce permanent damage and subsequent arthritis. Chronic irritation to a joint for occupational reasons may produce degeneration of cartilage Workers using pneumatic tools frequently develop this form of arthritis Such irritation may also result from abnormal joint mechanics due to obesity and poor posture Repeated bruising, joint dislocations, or fractures in or near a joint can ultimately cause cartilage degeneration and poor function. An acute or chronic infection in a joint has been shown to permanently damage cartilage Hemorrhage into a joint due to an injury may be followed by scarring and cartilage degeneration Foreign bodies such as a loose piece of cartilage in the joint can cause enough irritation to result in arthritis. A more unusual form of arthritis is that due to congenital joint defect or dislocations. The abnormal joint is chronically irritated as effort is made by the individual to compensate for the inadequate approximation of joint surfaces.

Treatment of arthritis due to injury is directed at the particular problem The arthritis commonly involves only one or a few joints Early recognition and prevention constitute the ideal management

GOUT Gout is a chemical or metabolic disease of unknown cause It is usually characterized by acute sudden attacks of arthritis with freedom from joint symptoms between times. It may

progress to constant arthritis although this is not common Tendency to gout may exist without joint signs at all A substance normally circulating in the blood and called uric acid is abnormally metabolized in such patients Deposits of a salt of uric acid, sodium urate, in joint, subcutaneous tissues, and bone complicate this disease. Kidney stones may occur due to uric acid precipitation. It is a hereditary disease, and proper diagnosis may be difficult Gout is distributed uniformly among all races, nationalities, and social levels It is not, as is usually assumed, caused by excessive eating or alcohol intake

NONARTICULAR RHEUMATISM This large category contains the commonest and the mildest forms of rheumatic disease It is made up of a sizable group of conditions producing pain and stiffness in connective tissue structures but not especially involving joints directly. Few people go through life without having at least one attack of painful stiff neck, lumbago, myositis, bursitis, or just stiffness of muscles Such conditions are mild and of little consequence Patients do not go to physicians, since they attribute the problem to overexertion, minor trauma, and chilling or cold and treat themselves with home remedies The doctor sees only a small proportion of such cases These disorders are considered as a group because they seem to be related

Fibrositis is a disorder that primarily affects nonarticular fibrous tissue The term is in general usage, but the cause of this disorder is unknown Pain and soreness of muscles are its main characteristics It may be localized or generalized, it may be confined to the back, or stiffness and soreness may be generalized throughout the body Bursitis or tenosynovitis are forms of localized fibrositis In many instances fibrositis is associated with acute infections, injury, unusual physical activity, exposure to dampness and cold, or undue fatigue In the majority of cases, however, there are no factors that can be incriminated with any certainty Nervous tension, anxiety, and stress have been increasingly accepted by many workers in rheumatism as at least partial cause The outlook is quite good

Crippling and deformities never result. Treatment consists of restriction of activity, rest, the use of heat in the form of hot packs, massage, and aspirin

Lumbago The term lumbago means a painful, stiff, tender back This is localized fibrositis. Muscle spasm is often severe, a ruptured intervertebral disk may cause lumbago, this requires expert care

Bursitis and *Tendonitis* A bursa is like a sort of fluid cushion, *it may become inflamed. This is a form of localized fibrositis* Injury may result in bursitis More commonly there is no known cause It seems to involve the shoulder bursae more often than elsewhere This disorder can be a real problem because of limitation of use of the shoulder The best treatment is a multiple approach, using drugs, exercises, rest, and physical therapy Tendonitis refers to inflammation of a tendon

Tenosynovitis Tenosynovitis is an inflammation of tendon *sheaths When this disorder involves one of the flexor tendon* sheaths to the finger it may result in "trigger finger," a scarring of the tendon sheath causing contraction and shortening of the tendon Tenosynovitis may occur in any tendon sheath

Fascitis This disorder may occur in many places. It is most often seen in the palm of the hand Its cause is unknown, and there is much speculation about it

Psychogenic rheumatism is a form of nonarticular rheumatism which is thought to be a rheumatic manifestation of a psychoneurosis The cause of the discomfort is most probably continuous and sustained muscle spasm occurring because of emotional conflict caused by psychic injury, fear, anxiety, apprehension, or sorrow *Arthralgia, muscle and tendon aches, stiffness, and interference* with joint motion, resembling some forms of arthritis or fibrositis. may occur. In general such people are in good health, but considerable disability results because of the symptoms

JOINT TUMORS

A rare problem in rheumatology is a tumor in or about a joint. The tissues of joints are subject to overgrowth or new growth as are tissues elsewhere in the body. Tumors, both benign and malignant, do occur. Most joint tumors are benign, and mechanical interference with joint function is the main problem.

JOINT SYMPTOMS IN OTHER THAN RHEUMATIC DISEASES

Joint involvement may occur in association with many other diseases. Joint symptoms may be quite minor or may be a very major part of the problem in certain diseases.

Acromegaly is an endocrine or hormonal disorder which produces a kind of degenerative joint disease. The disease is caused by over production of a hormone in the pituitary gland, excessive bone growth occurs. This may result in pain.

Psoriasis is a skin disease also associated with a disabling rheumatic disease closely resembling rheumatoid arthritis. It is conjectural whether or not they are the same disease.

Hemophilia, the bleeder's disease, may produce arthritis when bleeding happens to occur into a joint, causing heat, redness, and swelling.

Ochronosis is a very rare, chemical, inheritable metabolic disorder in which there occur deposits of a substance called homogentisic acid in and about joints and cartilage. The spine is the common site of involvement. This may result in a rather disabling rheumatic disease.

Allergic sensitivity to drugs may result in joint swelling, heat, and pain. Penicillin has infrequently caused this type of arthritis.

Thus, there are many types of rheumatism. Even though the predominating important diseases are rheumatoid arthritis and

degenerative joint disease, there is always a problem in diagnosis. Because misdiagnosis may occur, it is important to seek a physician interested in and informed about rheumatic disease to learn with as much *certainty as is available what the specific problem is* All that creaks and aches is not arthritis.

RHEUMATOID ARTHRITIS

This book is mainly concerned with rheumatoid arthritis, the principal rheumatic problem It is important to learn as much as possible about rheumatoid arthritis. what is known of its cause, how it may damage tissues, how to treat it successfully, how not to treat it, and the future in regard to cure possibility The more one knows of rheumatoid arthritis, the better result he can expect from treatment

The cause of rheumatoid arthritis is unknown It is somewhat misnamed, its name, arthritis, suggests that it is only an inflammation of joints. This is one part of a much broader disorder. It is believed today that rheumatoid arthritis is a disorder of connective tissues throughout the body "Connective tissues" mean simply tissues that "connect" or hold together—the supporting tissues The connective tissues are ubiquitous throughout the body They constitute the environment in which all body cells live.

All cells of the body of all kinds are suspended in a sticky, viscous, gelatinous substance This material is present in all body tissues and is called the matrix or "mother substance"; ground substance is another name for it It is a complex chemical material made up of a mixture of protein and a complex sugar, it is called a protein-polysaccharide complex

The "ground substance" of *different tissues is of varying stickiness* or viscosity, from an almost watery consistency to tremendous degrees of stickiness (high viscosity) The high viscosity is due to the long-chain, complex sugar molecules. There are cells distributed through the "ground substance" It is the environment

in which they live, "breathe," and function, and from which t derive nutrition Throughout the ground substance is an in lacing, tiny meshwork of microscopic fibers of three basic typ Most of them are a protein substance called collagen Collagen i very tough microscopic fiber having a high degree of tens strength Tendons and bones are largely made of collagen

This is the basic structure of all tissue whether we deal with skin joint, ligament, tendon, muscles, nerve, kidney, liver, intestine, o bone Thus, the basic elements of the connective tissue of any part of the body are the ground substance (sticky, viscous complex sugar and protein), fibers (collagen, reticulin, and elastin), and cells (mainly cells called fibroblasts)

Rheumatoid arthritis is characterized by abnormal changes of varying degree in the connective tissues The more severe the disease the greater is the alteration from normal of the connective tissues. The "ground substance" becomes less viscous, and swelling occurs. The chemical materials making up the ground substance and the myriad interlacing fibers change their chemical characteristics The types of cells in the ground substance change as new inflammatory cells migrate into it The gross result which is felt and noticed by the patient is that the involved tissue, be it joint, tendon, or muscle, becomes swollen, tender, hot, and red Stiffness, discomfort, and limitation of motion follow

The greatest pain is in joints Joints hurt and, hence, attract the attention of physician and patient It is unfortunate that all attention has been directed to joints to the exclusion of the issue that this is a systemic or generalized disease Treatment, to be successful, must be directed at the total problem, at all connective tissues, whether or not they attract attention by pain and swelling

Rheumatoid arthritis has been variously claimed to be an infectious disease, a chemical or metabolic disease, a disease of the endocrine glands, a disease of the circulation or of the nervous system, a psychic disease, and an allergic disease There is some

tendency for it to occur repeatedly in families. This list serves to show how little was known about the basic cause of rheumatoid arthritis

The disease is three times more common in women than in men Eighty per cent of cases occur between the ages of 25 and 50 years with a peak incidence at the age of 35 to 40. Current evidence suggests that rheumatoid arthritis may be much more common in older age groups occurring in a milder, usually unrecognized form Onset of rheumatoid arthritis may be insidious, rendering early diagnosis difficult Critical judgment is necessary for accuracy of identification. It may be impossible to be sure that symptoms do or do not represent onset of the disease. Initial complaints are as nonspecific as fatigue, exhaustion, disinterest in surroundings as well as family and friends, tingling sensations of fingers and toes, muscular stiffness, loss of weight, and general lack of well being Symptoms become more pronounced later; it seems probable that onset occurs when the nonspecific symptoms appear. Exact time of onset may be impossible to delineate.

About 75 per cent of patients have an insidious onset over months or years, one or more joints become gradually swollen and painful, and others slowly follow. There may be periods of freedom from discomfort and stiffness The patient may not feel generally sick during early stages, or there may be slight fever and a feeling of illness Feet are often the first joints involved, characteristic changes in the hands appearing later. More rarely the disease begins abruptly with severe *painful, hot, red joints and a high fever*

A characteristic of the disease is its symmetrical joint involvement. Smaller joints of the hands are particularly prone If one joint is affected, the corresponding joint on the opposite hand becomes involved. End joints of fingers escape while knuckle joints are commonly involved This is contrary to the case in degenerative joint disease (osteoarthritis) in which the end joints of the fingers are most commonly involved.

In every joint is a type of connective tissue called the synovial membrane. This is made up of the usual type of connective tissue. It is in the synovial membrane that the greatest intensity of inflammation occurs Swelling and heat in this tissue are responsible for the painful joint. This is technically called a synovitis, or inflammation of the synovial membrane.



Figure 3 Profile view of elbow subcutaneous nodules of rheumatoid arthritis

A characteristic joint in rheumatoid arthritis is swollen and painful with limited movement The nature of the swelling is distinctive There is often wasting of muscle above and below the joint The joint appears spindle-shaped Muscles about the joint develop continuous and sustained spasm, and when untreated, this may cause permanent contractures In long standing, untreated chronic disease, elbows, toes, wrists, hands, knees—almost every

joint in the body—may become involved. There are scarring and bony bridging of the joints, finally rendering them almost useless unless treatment is relentlessly pursued. Muscles become weak and gradually waste This may be a striking feature of rheumatoid arthritis Muscle wasting rarely occurs in the absence of joint pain

The skin becomes smooth and glossy in appearance. There may be redness of the palms, and the hands frequently become cool and clammy. A hallmark of rheumatoid arthritis is called the subcutaneous nodule (Fig 3). These are little lumps or bumps beneath the skin They are most commonly found over the elbow in the "crazy bone" area They vary in size from a seed to an olive or larger, and feel gristly or cartilage-like to the touch. They are not tender or painful unless their position exposes them to undue pressure, when ulceration occurs

Fever is unusual but may occur intermittently during acute flareups. Weight loss is common; general nutrition suffers in the patient with rheumatoid arthritis if not successfully treated Lymph glands under the arm, in the groin, and at the crook of the elbow frequently become enlarged. Eyes may become inflamed preceding or accompanying rheumatoid arthritis, a condition called rheumatic iritis

X-ray examination of joints and bones is helpful in diagnosis once the disease is well established. It is of little use in early stages Characteristic changes appear in bones and about joints, aiding in diagnosis. Certain blood changes help. Tests called the sedimentation rate and agglutination reaction are useful in identifying rheumatoid arthritis in obscure or nontypical cases Blood serum of rheumatoid arthritis patients contains a substance that produces clumping together of sheep red blood cells This "agglutination" test is accurate and reasonably specific. Fluid accumulating in swollen joints undergoes chemical and cellular changes that on examination aid in identification of rheumatoid arthritis

There are many variants of rheumatoid arthritis which are important to know about. When it occurs in infancy or childhood, it is called Still's disease, named for the man who first described it

Actually there is little fundamental difference between juvenile rheumatoid arthritis and that occurring in adults. If the disease is associated with a large spleen, a low white blood cell count, and an enlarged liver it is called Felty's syndrome, after the man who described this combination. Another variant is rheumatoid spondylitis, an inflammatory process mainly involving the spine. Some workers believe this to be rheumatoid arthritis of the spine, and others that it is a separate disease. It is nine times more frequent in men than women. There is a strong tendency for the skin disease psoriasis to coexist with rheumatoid arthritis. Some workers believe they are the same disease with differing manifestations. The question remains open.

OUTLOOK IN RHEUMATOID ARTHRITIS

Although a vast amount of crippling and deformity due to rheumatoid arthritis has occurred, the outlook today is very hopeful. It is insufficiently appreciated that a few patients recover more or less completely. The natural history of rheumatoid arthritis is that of flare-up and subsidence, in varying patterns. The flare-up may occur once a month, once every three months, once a year, or once every ten years; it is quite unpredictable. Frequency of recurrence is uncertain in any given case. There are many treatment measures available, the aggregate of which alters the natural course of the disease. These are outlined in later chapters. *Treatment is time consuming and must be done daily* but is little price, indeed, in exchange for prevention of crippling.

Rheumatoid arthritis commonly becomes quiescent or arrested in its course, and patients are able to carry on activities with little handicap. In rare cases the disease follows a cruel and inexorable course producing severe disability. This is the great exception to the rule. It is not possible to say with certainty what events will occur in an individual patient. In the most favorable case a severe flare-up may ensue at any time. There are now ways of readily extinguishing this hot fire, or at least turning it down to a scarcely

smoldering ember The most severe disease may suddenly, inexplicably become arrested It behooves us to *constantly* do the things we know to favorably influence the natural course of rheumatoid arthritis

In spite of the antiquity of rheumatoid arthritis and the recent enthusiastic interest and progress, there have been few observations on the natural course of the untreated disease Despite absence of cure in the sense that the disease is eliminated, it is usually controlled, pain is relieved, joint function is increased, and damaged joints and muscles are reclaimed for effective use. Because rheumatoid arthritis is a disease of connective tissue and connective tissue exists throughout the body, the patient must be treated as a whole, therapy is designed to influence all connective tissues, including joints.

SUMMARY

The patient with rheumatoid arthritis should know the characteristics of the disease as he considers the treatment results

1 The disease is one that fluctuates with spontaneous relief and recurrences

2 Some patients recover quickly and spontaneously Treatment being used at the time of spontaneous recovery may receive false credit An adequate appraisal of treatment in this disease requires years of observation Evaluating treatment claims is a major problem

3 One can say neither that a type of treatment is worthless nor that it is effective until it has been followed for many years by competent observers

4 This capricious behavior has been responsible in the past for exploitation of patients with rheumatoid arthritis

5 The comprehensive home care program described in Chapters 1 and 6 utilizes the aggregate of the methods which have regularly and favorably influenced the natural course of rheumatoid arthritis



Chapter 3

THE ANTIQUITY OF RHEUMATISM

PREHISTORICAL RHEUMATISM

Disease is known to have existed for two to three hundred million years. Fossils of animals and plants from the earliest strata of the earth's crust (450,000,000 to 550,000,000 years ago) show no recognizable evidence of disease. Bacteria of a harmless type had probably appeared.

The earliest known example of multiple arthritis in a fossil vertebrate is in a skeleton of platecarpus, a very large swimming reptile, which lived about 100,000,000 years ago. Platecarpus arthritic bones now reside in the Museum of Natural History at the University of Kansas. In early Mesozoic strata (100,000,000

years ago) there is unquestionable evidence of osteoarthritis (degenerative joint disease) in many reptiles and fish. Arthritis has been frequently observed in dinosaur remains. Osteoarthritis was common in cave bears and Miocene horses, proven by examination of fossil remains.

Earliest man was not spared from rheumatic disease. In 1891 Dr DuBois, a Dutch army surgeon, while digging in the basin of the Solo River of Central Java discovered the teeth of a peculiar type of ape. He dug vigorously a few feet from this spot, there lay bones of Pleistocene man (*Pithecanthropus erectus*), 500,000 years old Pithecanthropus was arthritic (osteoarthritis), It is an interesting coincidence that man's first written work was a medical treatise (the Edwin Smith Surgical Papyrus), also the bones of the first primitive man discovered showed evidence of disease, a severe osteoarthritis of the thigh bone and hip joint

Heidelberg man was thought to have tuberculous arthritis or "Pott's disease" of the spine Neanderthal man showed rickets (deficiency in vitamin D) of bones of the left forearm. Piltdown man probably had a hormonal kind of rheumatism His bones and joints were large with acromegaly, a disease due to oversecretion of the growth hormone of the pituitary gland.

Prehistorical man may have stood and walked as erectly as his twentieth-century descendants—but like many a modern man, he was plagued with arthritis. Dr. William L. Straus, Jr, of Johns Hopkins University studied the reconstructed skeleton of the Neanderthaler in Paris Arthritic joints were noted in the jaws, the left hip, and the joints of all parts of the spinal column. There was much bony overgrowth and so-called bony lipping about the joints.

The skeletal structure, previously interpreted as signifying a semierect posture could more logically be explained as osteoarthritic deformities Similar arthritic joints can be found in most fossil remains, both human and animal, of the Neanderthal period, indicating that the disease was widely prevalent, 500,000 years ago

There does not appear to be any scientific justification for the

concept that men 500,000 years ago were bent over, shambling brutes If you happened to see Neanderthal man dressed in modern clothes boarding a train or a bus, it would be difficult to distinguish him from his fellow travelers—at least from the back.

Skeletal arthritic abnormalities have been observed in bodies found in Nubian graves dating back to 8000 B C This proves that inhabitants of ancient Egypt suffered from gout, tuberculosis of the spine, infectious arthritis, and osteoarthritis *

RECORDED HISTORY OF RHEUMATOLOGY

By the time historical man appeared on the earth the disease was identical with that of today. Some 30,000 splendidly preserved Egyptian mummies have been studied. Arthritis was commonly observed In their excellent state of preservation the mummies have provided much useful current information And it is probable that 5000 years ago Egyptians discussed their problems of rheumatism

Wild animals and prehistorical and historical men were subject to the aches and pains that civilized man has today Arthritis is the disease most often apparent in ancient bones Chronic arthritis of the hip joint is observed only in man This type, oddly, afflicted Peruvian Indians more than any other primitive people Osteoarthritis was common among pre Columbian Indians, and tuberculous infection of spine joints was also frequent

Dr Erwin A Ackerknecht, medical historian of the University of Wisconsin, has pursued study of modern diseases of ancient man Much was learned from ancient paintings, sculptured pictures, and x ray photographs of Egyptian mummies Dr Ackerknecht reports that as Greek civilization developed the Greeks became bigger and healthier Expansion of Greek culture between 800 and 500 B C. was accompanied by an increase in body size and in life span There was concomitant decline in occurrence of arthritis, bad

* Ruffer, M A *Studies in the Paleopathology of Egypt*, edited by Roy L Moodie University of Chicago Press Chicago 1921

teeth, and infant mortality After 400 B.C the general health of the Greeks again took a turn for the worse as their civilization declined

About the year 600 B.C. a physician, Alexander of Tralles, introduced the plant, *meadow saffron, as a source of an important* medicine for arthritis. He called the medicine "thermodactyl" or "anomar articulorum." This drug was soon forgotten. However, it was rediscovered in the early eighteenth century by an Austrian physician named Von Storck. Today it is called colchicine and is a very important drug in the treatment of gout.

The first book about arthritis was written by Aretaeus, the Cappadocian, who lived between 100 and 200 A.D. He described cases of acute gout and cited an example of an athlete able to run in the Olympic Games between attacks of severe gout He used the term podagra synonymously with gout.

The physicians of ancient Greece and the textbooks written by Hippocrates describe, "A disease with fever, severe joint pain fixing itself in one joint now, then in another, of short duration, acute, not leading to death, more apt to attack the young than the old." This is a classical description of rheumatic fever.

Galen (130-ca. 200 A.D.), a Roman physician, first used the word rheumatism The Romans regarded gout as a disease of the rich and intemperate. Emperors Augustus and Alba both had gout Since that time gout has been the target for satirists in art and literature A poem about gout titled *Tragodo Podagra* was written by the Roman, Lucian (125-190 A.D). It was reprinted by a famous British physician, Thomas Sydenham, sixteen centuries later.

During the Dark Ages and the Middle Ages there is little recorded to suggest that any attention was given to rheumatism There was only faint, painfully slow progress during these bleak centuries A clinical description was made occasionally by a discerning physician, often remaining a classic today

In the sixteenth, seventeenth, and eighteenth centuries there was more concern for and study made of the rheumatic diseases But

pace of progress against rheumatic disease was tragically slow despite efforts of a few great British and European doctors. Basic contributions by these few worthy physicians were few in number and too isolated by both time and distance to give them any continuity. They were widely separated milestones or road markers *failing to initiate any real productive movement.*

In 1592 Cornelius Van Baersdorp, the Court physician to Phillip II of Spain, published a book called *Consilium de Arthritidis Praeservatione et Curatione.* This book was based on the author's experience with his Majesty's gout.

In 1642 Guillaume de Baillou or Ballonius, a French physician, wrote a book, *De Rheumatisme.* This was published after his death. He defined the term rheumatism and differentiated between gout and other rheumatic diseases.

In 1683 Thomas Sydenham published his now classic treatise, *De Podagra,* on gout.

From 1870 to 1920 when exciting discoveries in bacteriology, surgery, and human biochemistry were appearing at every turn, there was little increase in understanding of the major forms of rheumatism. There arose the controversial theory of the role of a focus of infection which, after 40 years, has died a well-deserved death. Physicians of the time in earnest debate discussed effects on rheumatism of climate, weather, and the use of hot water. The relative merits of sea level versus mountain air for the rheumatic was a debated issue. The question of whether plain hot water was any better than sulfur, salt, or other types of water was widely discussed. Faddists were rampant.

Such was the treatment of rheumatism in the sixteenth, seventeenth, and eighteenth centuries. People of the time have written of and recalled the picturesque era of European spas with their royal and noble patrons, their unusual side shows. The spa treatment spread to the United States, and there exist today spas at Saratoga Springs, New York; Hot Springs, Arkansas, and White Sulphur Springs, West Virginia. These were places where the rheu-

matic went if he could afford it, and he rarely could. However, this was a useful era, case records were collected and studied by master observers.

MODERN RHEUMATOLOGY

It is a paradox in medical history that although arthritis and rheumatism are the most ancient human diseases as attested by medical archeology, the vigorous study of rheumatism was begun only in recent years Rheumatology as an active science is one of the newest branches of medicine. Untold centuries of silence elapsed before the present swelling tide began.

In the early 1900 s the heritage of physicians interested in rheumatism was little to cherish Rheumatology in 1900 remained at low ebb, clouded by ignorance and indifference The most able professors of medicine in this country and abroad were unenthusiastic and ineffective in teaching and treatment. Foundations of modern rheumatology were laid early in the twentieth century. The first cornerstone involved closer association of physicians interested in rheumatic disease Dr. Van Breemen of Amsterdam saw the need for a coming together of doctors interested in rheumatic patients. Informal meetings led by him were held between 1900 and 1920 His was a lone voice in the rheumatic wilderness Finally he formed not only a local team but many national teams or leagues. In 1920 the International League Against Rheumatism was formed with headquarters at The Hague in The Netherlands This strong organization currently has committees or branches in 29 countries of the world.

The second cornerstone was laid at the time of World War I Physicians other than orthopedic surgeons began to assume an early and continuing responsibility for rheumatic patient care Most such men were internists with a particular and consuming interest in rheumatic disease. They probed the causes of rheumatism from such standpoints as the question of bacterial infection,

biochemical or metabolic causes, or an unknown virus These were pioneer rheumatologists

The present rheumatism renaissance dates from the few years following World War I when Sir J Alison Glover of England wrote a series of three brilliant monographs concerning the health problem of rheumatic diseases After a great deal of study and preparation these were written and published in 1924, 1927, and 1928 Here for the first time the whole rheumatic problem was consolidated and made clear It was from these publications that much of the modern concepts of treatment and research arose For the first time an approach to serious research, seeking cause, was made The idea of arthritis clinics and research units came out of these monographs

Shortly after the war the Right Hon Neville Chamberlain, Minister of Health in Great Britain, became aware of and concerned about the large number of people on sick leave from their jobs because of rheumatism At Mr. Chamberlain s request, Dr Glover conducted his extensive survey of the rheumatism problem in England and Europe These studies and the monographs quickly became very well known The magnitude of the rheumatism problem was delineated, and Dr Glover awakened his own government as well as other governments and medical people throughout the world to the necessity of research in arthritis and better care of the arthritic patient

Team work—local, national, and international—has been established, and a modern scientific version of rheumatological specialization has come to the fore The development of rheumatology was greatly accelerated From 1920 to 1930 the content of this small specialty was not great, including only rheumatic fever and degenerative joint disease with rheumatoid arthritis, gout, and fibrositis in-between In 1930 the American Rheumatism Association was founded This organization has grown by enormous increments in the past 29 years Original members numbered 60 Content of rheumatological study has expanded strikingly, rather than

ment methods employed are useless, harmful, or of doubtful value There are methods of treatment which, in an aggregate, comprehensive program, favorably influence the natural course of rheumatoid arthritis These are discussed in Chapter 6.

The great problem in evaluating treatment in rheumatoid arthritis is that there is little information to date, established and proven, of the behavior of rheumatoid arthritis for a sufficiently long period of time without treatment. It is obvious in such an erratic disease, varying so widely with little treatment, that the proper evaluation of treatment is very difficult. The natural course of the disease is one of fluctuations in activity. There may be periods of weeks, months, or years of increased heat, redness, and swelling of joints, fatigue, weakness, and muscle stiffness, fever, loss of appetite, and anemia, swelling of lymph glands and lumps under the skin (subcutaneous nodules; see Fig 3). One can't predict how long in an individual case the rheumatic activity may last or how severe it may be. It varies from person to person and even from time to time in the same person. The period of increased intensity of symptoms is followed by improvement, the degree and duration of which are likewise not predictable. Rheumatoid arthritis follows a cyclic pattern of increased activity followed by remission and improvement

If a patient with rheumatoid arthritis is on the improving end of his cycle at a time when a certain treatment is being employed, he and his physician are apt to give false credit to the treatment, whatever it is Patients, relatively untreated, have cycles of improvement and recurrence with heat, swelling, and redness of their joints In a disease of such increases and decreases in intensity it is difficult or even impossible to determine what treatment is really effective, we don't yet know how the disease behaves untreated The treatment outlined in Chapter 6 consists of proven measures used in a suffi r of patient a long enough time to assure pre fit in most

From earliest times peo atoid artl en

victims to various claims of cure of their disease Misguided Americans will this year squander $100,000,000 on a great variety of "medicines" which are claimed to cure a wide range of diseases A large amount of this money will be spent by arthritics and their families It is of the utmost importance that the rheumatic patient and his family be educated regarding the nature of the illness in order to avoid being misled by both unintentional misrepresentations and frank, dishonest deception As long as human gullibility lasts, the sun will never set on quackery and medical frauds.

Arthritis "cures" announced prematurely by semiscientific people, which fail to live up to the publicity accorded them, cause as much heartache and disappointment as the frank frauds perpetrated on the public Arthritis cures are announced frequently Sometimes the motive is not reprehensible, being a mixture of egoism and misdirected enthusiasm in some scientifically short-sighted person Arthritis has been a fertile field for much fanciful and frothy "research"

Proper and ethical announcements of advances in medicine are made by physicians before scientifically critical medical forums The medical investigator presents his new facts, open to scientific probing, analysis, duplication, and verification by others Judgments are necessarily and rightfully conservative in accepting widely publicized discoveries at face value on any unskilled person's say-so For proper understanding and evaluation of "research" directed toward "curing" diseases never before cured, widely publicized in newspapers, magazines, and certain popular books, one can profit by reading Mark Twain's *The Adventures of Huckleberry Finn*

"I've done considerable in the doctorin' way in my time," says the Duke of Bilgewater "Layin on hands is my best holt—for cancer and paralysis—and sich things, and I can tell a fortune pretty good when I've got somebody along to find out the facts for me" His Worship of Bilgewater surely treated some arthritics

ERRORS IN RECOGNITION OF ARTHRITIS

Recognition of arthritis is not always a simple problem. The very common benign rheumatic state, degenerative joint disease or osteoarthritis, can be misinterpreted as rheumatoid arthritis. Improvement or "cure" with certain treatments is credited as a cure of rheumatoid arthritis when the patient actually never had this disease. There are several other benign rheumatic states that are readily confused with rheumatoid arthritis. Many "cures" were not really rheumatoid arthritis cures. Such cases provide the basis for the many "miraculous cures" following a variety of treatments. The patient is pleased and delighted in the belief he has been cured of a serious disease, the person recommending treatment is happy because he usually truly believes he has "cured" arthritis. The truth is that the patient was cured of a disease that didn't exist in him. This harms the many people who try the falsely credited treatment for years afterward, only to suffer keen disappointment as well as loss of time and money.

EARLIER FORMS OF TREATMENT

Many examples follow in which rheumatoid arthritis patients have been exploited by sometimes unscrupulous, more often by very conscientious people who propose and promote certain treatments which are of no value. There are always people who willfully or unknowingly promote useless treatment. These do no harm other than lose time from proper treatment and shrink the pocketbook. In some few instances, various remedies prove clearly harmful, either creating new disorders or accelerating the course of rheumatoid arthritis.

Vitamin D and Cod Liver Oil

Intermittently for years large doses of concentrated vitamin D preparations or cod liver oil have been used in the treatment of

rheumatoid arthritis It has no place in treatment except in the patient who is clearly vitamin D deficient, which is not common When it does occur, vitamin D is given for the vitamin D deficiency and not because it has any known influence on the arthritis

Cod liver oil and vitamin D are promoted by uninformed but conscientious people who have misconceptions regarding the role of calcium and phosphorus in rheumatoid arthritis These elements have no known causative role The rheumatoid arthritis patient should receive enough minerals and vitamins in his diet, the same as any other person No proof exists that vitamin D or cod liver oil is helpful There is overwhelming proof that its excessive use promotes deposits of calcium in kidneys and other tissues causing a new disease, often of greater consequence than arthritis

Vitamin C

Because of premature reports based on insufficient evidence, vitamin C has been given in very large amounts to patients with rheumatoid arthritis There is some rational reason for its use, but it has been largely discarded awaiting further study

Diets

Various diets have been used in rheumatoid arthritis for as long is people have been thinking about it A high caloric, high vitamin, elatively high-protein, anticonstipation diet is indicated, unless the atient is obese No specific diet is applicable to all patients with eumatoid arthritis A sensible food intake high in vitamins, calories, and protein and adequate in calcium, phosphorus, and iron is all that is necessary

There is no evidence that any of the following diets or food suggestions are of value in rheumatoid arthritis

1 Low-caloric diet
2 Low-carbohydrate diet
3 Changed acid base balance in the diet

4. Omission of so-called "acid" fruits and vegetables

5. Allowing only one type of food substance at a meal

6. A low-protein diet

7. Avoidance of fruit juices or the taking of oil in the hope of lubricating joints thereby

8 Low-salt diet

9 Low-fat, high-carbohydrate diet

A good daily diet contains two or three glasses of milk, several glasses of tomato juice or fruit juice, meat, sea food, or fowl, cheese, fresh green or yellow vegetables, butter, cream, and eggs as desired Additional foods are chosen by the patient provided they contain a sufficient number of calories to maintain weight or increase it if the patient is underweight On the contrary, the obese arthritic must avoid further weight gain, and, indeed, a part of his treatment is loss of excess fat.

Meat is necessary to the arthritic because of its protein content which is vital to repair and building new tissue. Citrus fruits are important because of their vitamin C content. *This does not imply* that the arthritic is deficient in vitamin C. He needs it as does anyone else to maintain health There is no good reason why any food or class of foods should be either restricted or urged in the diet of arthritics Foods causing gastrointestinal upsets or allergy are obviously to be avoided

Exposure To Radioactivity

From time to time exposure to radioactivity has been utilized In Montana in recent years exposure to radon gas in two abandoned uranium mines has been used in treatment of rheumatoid arthritis * Patients are taken into the mine and exposed to a minor degree of radioactivity. Enough patients happen to be improving at the time they go into the mine. They tell friends and relatives. Thus,

* *Life Magazine*, July 7, 1952

radioactive exposure is accredited illogically with producing improvement or even cure

There is no foundation in fact regarding efficacy of treatment by exposure to radiation As always there are stories and pictures, authentic enough, of people who could not walk when they entered the mine and were able to do so on leaving Entering the mine and being able to walk afterward does not necessarily constitute a valid cause and effect relationship, especially is this so in arthritis A patient with deep faith in any measure is helped unless he is a rare case of extremely severe disease

Exposure to radioactivity of this type does no physical harm, but the fees may be excessive The important issue is that the arthritic patient and his family know the facts and then act according to their best judgment There is no sadder situation than the person with chronic arthritis who has at great financial, physical, and emotional sacrifice made an investment in a "cure" for arthritis only to be embittered and disappointed further by failure *If cure is found, there will be no halo of mystery and chicanery about it* It will be regularly predictable and reproducible. It will become available to all and probably at little expense

Vaccines

Vaccines of many types have been used on and off for years In the light of present knowledge no vaccine has a place in the treatment of rheumatoid arthritis Vaccines cannot "straighten out" chronically deformed joints No proof exists that any bacterium or germ causes rheumatoid arthritis Improvement may follow use of vaccine because the patient has implicit faith in it The psychic effect is worthwhile Such effects are more lasting if faith is placed in some measure with a more definitive, proven background There are occasionally optimistic reports in medical journals and very commonly in magazines and newspapers on use of nonspecific vaccines

Sulfur

From 1930 to 1940 there was a wave of enthusiasm for sulfur injection treatment This method has run its course. There is no known abnormality of sulfur chemistry in the body, and no known chemical need for sulfur. Informed people are not using sulfur in the treatment of arthritis today.

Warm sulfur-containing mineral springs have long been used in treatment. Remarkably curative effects of such baths have been claimed. Sulfur content of such waters plays no role in improvement Improvement occurs because the water is hot and buoyant. Hot water in the bathtub is fully as effective and much less expensive.

Bee Venom

Bee venom, as actual bee stings or injected bee venom, has been periodically recommended by scattered workers for 50 years It has been claimed that bee keepers do not develop arthritis; however, there is no proof for this belief. Unpleasant and even dangerous symptoms have occurred from this form of treatment Beneficial results are certainly so poor that it has been discontinued. Uncritical appraisal may make it seem initially effective Bee venom therapy, as with many other treatments, is periodically used with enthusiasm and honest belief in its efficacy. If 100 patients or more are treated for one year or more, there will be 35 to 40 per cent improvement as a natural event unrelated to treatment. This is enough to encourage users to continue. It requires a painfully long time for such misguided treatment efforts to run their course, and even then they keep cropping up with renewed waves of enthusiasm.

Cobra Venom

Cobra venom as well as venom of the pit viper, water moccasin, and copperhead was used There is no scientific evidence to support treatment of rheumatic conditions with the venoms.

Antireticulocytotoxic Serum

Fifteen years ago a Russian, Dr Bogomolets, invented and claimed that small doses of a serum called "antireticular cytotoxic serum" was effective in treating and curing rheumatoid arthritis It was further claimed to prevent aging This story was carried with considerable spread and excitement in American newspapers. It resulted in much unrest in rheumatoid arthritis patients who, understandably, wanted desperately to obtain and use some of this "magic serum" It has been proven to have no scientific validity The results obtained by Dr Bogomolets have not been confirmed or reproduced by any of the other workers all over the world who have used the precise methods he did. The serum has inevitably dropped out of sight There is no objective evidence of its value *in treatment*

Spinal Pumping

In 1939 an Austrian, Dr Speransky, acting on the theory that arthritis is an abnormality of the nervous system applied a treatment which he called 'spinal pumping" This was repeated withdrawal and vigorous reinjection of spinal fluid to patients with arthritis He claimed excellent results Again it has not been possible to reproduce his results The treatment *is irrational*, unacceptable, and dangerous

Chaulmoogra Oil

Chaulmoogra oil, one time treatment of leprosy, has been used in rheumatoid arthritis It was claimed that because rheumatoid arthritis did not develop in lepers their treatment with chaulmoogra oil was responsible Both this conclusion and rationale were fallacious Local pain and abscesses may occur from such injection. This, like so many drugs hailed as arthritic cures, fell by the wayside on trial in controlled cases by people skilled in medical investigation There is no justification for using chaulmoogra oil

Neostigmine (Prostigmin®)

A commonly used drug called neostigmine (Prostigmin®) was *used enthusiastically in 1944 in arthritis treatment and allied conditions* Extensive investigation did not confirm initial results Neostigmine has no place in the treatment of rheumatoid arthritis

Drug Therapy

Arthritis patients often inquire about *penicillin* and *sulfa drugs* Researchers have found some connection between streptococcal infections and rheumatoid arthritis. Study and research into this aspect continue. Sulfonamide drugs and penicillin have been tried with disappointing results. Antibiotics and sulfa drugs have no effect on the course of rheumatoid arthritis unless there exists some indication for their use as in any other patient

Iodides and *arsenic* have both been used There is no specific benefit derived from either, although their use has been intermittently popular

Chlorophyll

A few years ago a tidal wave of chlorophyll commercialism inundated the country, and the substance was used in products as widely varying as fertilizer, tooth paste, and fly spray. Inevitably it found a short-lived use in the treatment of rheumatoid arthritis but, happily, faded rapidly away, never reaching the popularity and longer usage that many other irrational treatments have. It will probably reappear.

Charms and Amulets

All sorts of amulets have been recommended and used. Copper plates have been inserted in shoes in the hope that it would relieve arthritis of ankle and foot joints. If a sufficient number of people put copper plates in their shoes, there are inevitably enough of them improving in the natural course of their disease to en-

courage further use Thus, a treatment of this kind is perpetuated until it runs its natural course of several years with final discard Copper wrist bands are used periodically with variable results. It is suggested in any individual case that charms or amulets can do no harm, unless they are expensive and then they harm the patient's pocketbook, not the patient The only damage that may accrue is loss of time in proper comprehensive treatment Charms used or worn along with thorough general treatment can only result in favorable consequences. There is no objection to their use in this treatment setting

Frank Quackery and Fraud

Medical frauds and quacks in earlier centuries relied on the mysterious powers of some charm, theriaca, or fetish A spell was cast, devils were exorcised, or the evil eye was put on a victim The credulity of the twentieth-century public is more technological, *but no less credulous* "Electric" bracelets (ordinary copper bands) are marketed today as cures for arthritis. "Special garters" are made —and sold briskly, the claim is that they can create elegant legs of arthritic and rheumatic ones

"Electronic quacks" are common An instrument sold as an "Oscilloclast' is claimed to be able to diagnose all types of arthritis —or any other illness A recently exposed fraud was in a device called "Radio Therapy" and "Radio Vision" instruments Another name is "Homo Vibra Ray " These "instruments" were said to be "based on the laws of energy and adjusted to tune into the most delicate vibrations" There is no foundation in fact for efficacy in either diagnosis or treatment for any of these measures

The most common medical frauds today, in order of their popularity, are

1 Dietless reducing schemes
2 *Sure cures for arthritis*
3 Sure cures for cancer

4. Cures for baldness
5. Correction of sexual impotence
6. Methods for bust development

The medical quack frequently changes from one health field to another—from cancer to anemia and on to arthritis, whichever seems the more lucrative at the moment. The motivation is money, not any real desire to serve mankind.

There is always much interest in faith healers, itinerant and permanently ensconced, and most communities have such faith healers. This type of treatment is conducted by newspaper and magazine, radio and television, as well as the necessary personal contacts. Obviously arthritis is a fertile field for the faith healer since the disease is one that fluctuates widely. No ethical, sensible physician denies that faith in a higher power is an extremely potent force tending toward recovery. When this power is strangely "mysterious," or in the possession of one person, or when there are fees charged for the "healing," then one doubts the veracity of the "healer." Surely faith, God, and universal spiritual forces are not the property of a few people.

Should a person with arthritis feel strongly that he is being helped by a faith healer and really has faith in this form of treatment, doctors would have no objection; *however*, if time and money are lost and the disease progresses to joint destruction, it is tragic.

Alfalfa Tea

A tea made of alfalfa has been used in various parts of this country with "good result." Again, if a sufficient number of people take alfalfa tea who are improving anyway, enthusiasm will rise. An alfalfa extract is now available as a capsule and enjoys considerable popularity. It is more expensive than the tea and is pseudo-commercially available. *It is of no real benefit but is inexpensive and* does no harm.

Fever Therapy

Fever therapy was used for many years. This consisted of repeatedly producing short periods of fever by injecting typhoid vaccine in the blood. Other methods of fever treatment include hot tub baths, blanket packs, "fever cabinets," and Turkish baths. Foreign proteins used by injection to produce fever include typhoid vaccine, boiled milk injected into muscles, and injections of the patient's own blood. There is no favorable evidence to support this form of treatment. Even when popular, it was reserved for patients responding to no other treatment. It is said to be of greatest value in patients whose symptoms have reached a standstill during the recovery stage and whose stiffness remains as an outstanding symptom.

Chiropractic

Chiropractic treatment of arthritis is naturally very popular. The techniques of chiropractic are peculiarly attractive. They offer cure or alleviation of virtually all diseases by a process of locating and presumably removing interference with nerve impulses. Chiropractors concern themselves largely with the spine and its manipulation. It is small wonder that chiropractic enjoys "success" with treatment of rheumatoid arthritis. The disease is so erratic that inevitably a sufficient number of patients would be improving naturally at the time chiropractic was initiated.

There is no proof or evidence that any abnormal function of the spine, spinal cord, or peripheral nerves is responsible for rheumatoid arthritis. There are fantastic claims, always accompanied by pictures and testimonial letters, supporting efficacy of chiropractic. When real proof is sought by informed persons, it is lacking. Chiropractic can be helpful by its use of massage and physical therapy and by the establishment of belief on the part of the patient that the treatment will be effective. Such is true of the

same treatment applied by other than a chiropractic physician The basic disease, however, is unaltered

EVALUATION OF FORMS OF TREATMENT

It is easy to see why rheumatoid arthritis patients and their families are victims of exploitation. They hope for cure Perfectly legitimate pictures and stories of patients dramatically "improved or cured" after having had various treatments are highly convincing. An essential part of treatment of the rheumatoid arthritis patient is education about the natural course of the disease It is an established fact that the natural course of rheumatoid arthritis is characterized by periods of increased activity of the disease process and disability which is then followed by improvement. It is less generally known that the disease often becomes arrested and that some rare patients recover completely. If a patient happens to be using some treatment when he is recovering naturally, the treatment of the moment receives undeserved credit. It requires years for this wrongly interpreted sequence of events to reach its ultimate inevitable conclusion

From the researcher's point of view, efforts to gather reliable long-term information are handicapped because most patients receive some form of treatment which conceivably could influence the natural course It is necessary to rely for such information on groups of patients whose treatment has been confined to simple nonspecific measures as outlined in Chapter 6

Any patient with rheumatoid arthritis has seven chances in ten of being much improved by using this treatment. There are an additional two chances in ten that significant improvement will follow A small number of people seemingly recover completely.

Another reliable observation is that the most striking factor affecting outlook is the duration of disease prior to the initial medical observation and treatment Outcome is most favorable in patients seen in the first six months of their illness Eighty-one per

cent of such patients improve satisfactorily and live comfortably. Eminent success of treatment is not as likely in patients whose onset dates back more than one year without proper treatment

Many factors commonly thought to be important in predicting the course of rheumatoid arthritis are now known to have no influence For instance, the presence of anemia has no effect on the course Duration of symptoms of minor stiffness before onset of more severe symptoms is unimportant. Intermittent rather than steady progressive illness prior to initial treatment has no influence on the ultimate course of rheumatoid arthritis Abrupt severe onset rather than a gradual one is associated with no more disability than other types of onset Family history of rheumatoid arthritis or rheumatic fever is of no prognostic significance

It is concluded that it remains impossible to predict in the individual patient the course of his disease when untreated In a patient with mild rheumatoid arthritis a severe relapse may occur without warning while the most severe example of the disease may suddenly become arrested for no known reason. When reasons for such events become known, great progress will have been made into the fundamental nature of the disease





Chapter 5

TWO MAJOR RHEUMATIC PROBLEMS

About 75 per cent of all rheumatism sufferers have either rheumatoid arthritis or degenerative joint disease. These disorders are presented here in detail. There are many forms of more acute rheumatic disease, such as rheumatic fever, gout, or infection of a joint by specific bacteria. These diseases are well treated, mainly with drugs. Major rheumatic health problems of the United States and of the world are rheumatoid arthritis and degenerative joint disease. There is no curative treatment for either of these diseases. Proper care consists of use of a comprehensive treatment program utilizing many methods known to be effective.

It is necessary for the rheumatism patient to be examined by an interested and qualified physician or to attend an arthritis

clinic to determine in which category his disorder belongs Contrary to common belief, diagnosis may be a difficult and highly involved process Proper care depends upon accurate diagnosis In general, treatment is effective in both conditions It requires time, effort, enthusiasm, education, and long-range belief in efficacy of treatment by both patient and physician

RHEUMATOID ARTHRITIS

Rheumatoid arthritis, the great crippler among rheumatic diseases, constitutes one of the world's major medical, social, and economic problems It has been estimated by some authorities that there are 4,000,000 people with rheumatoid arthritis in the United States People developing rheumatoid arthritis are attacked in their most productive years There follows a description of the salient aspects of this disease

Cause

The cause of rheumatoid arthritis is unknown There are certain factors on which there is general agreement These are important for the patient to know

1 Eighty per cent of cases occur between the ages of 20 and 50 with peak incidence at 35 to 40 years More recently studies have shown that as many as one in five women over the age of 60 may have rheumatoid arthritis in mild, often unrecognized form Recent studies show that the disease occurs in the elderly as well as the young Rheumatoid arthritis has been observed in 70-, 80,- and 90-year-old people

Of 100 consecutive patients whose illness began after the age of 60 years, one half were men Rheumatoid arthritis is being recognized more and more in very young children, aged two to four There is another peak incidence in children at the age of nine It is now estimated that approximately 16,000 children in the United States have rheumatoid arthritis Proper diagnosis and care are especially urgent in children The disease is frequently associated

with high fever, it lasts for many months, and lymph glands and spleen enlarge. Bone growth is impaired, leading to deformity or even dwarfism as the child matures. This developing field of incidence inquiry suggests figures much higher than those previously reported for all age groups Concepts of the present incidence of the disease and the ages of patients it attacks are rapidly changing. It occurs from infancy to senescence.

2. There is a familial tendency

3 Women are more commonly affected than men in a three to one ratio.

4 Emotional injury or very difficult or impossible life situations frequently precede onset of rheumatoid arthritis This may be manifested as a severe depression.

5. Rheumatoid arthritis seems to occur with greater frequency in temperate climates than in the tropics; this point is unproven

Theories of the cause of rheumatoid arthritis have been advanced for as many years as people have been thinking about it It has many characteristics of an infection such as fever, increase in white blood cell count, glandular enlargement, increased sedimentation rate, and rapid heartbeat. The most extensive investigations of blood, joint fluid, and culture of tissue have failed to reveal any germ or causative agent. Thus, it is a nonspecific, inflammatory (hot, red, and swollen) disease of unknown cause. It has been thought to be a disease of endocrine glands (glands of internal secretion, e g., thyroid, adrenal, testis, ovary, pituitary). Some workers have thought that it was due to deficiency of some food substance. It has also been considered an allergic disease. Considerable investigation continues along this line. However, these theories as to cause have not been confirmed. Some have postulated repeated injury as a causal factor in rheumatoid arthritis. Others *have studied nervous and mental causes leading to rheumatoid* arthritis. It has been considered in part a psychosomatic disorder

Environmental factors such as employment, finances, housing, diet, and specific wartime psychological problems have been studied in many patients. Possible precipitating causes such as shock, worry,

and grief are often related to onset of rheumatoid arthritis Specific personality patterns have been studied. This work has not resulted in definitive conclusions Many patients with rheumatoid arthritis have no such manifestations

Rheumatoid arthritis may begin or a flare-up may occur following a severe injury or a surgical operation, an acute infection such as tonsillitis or pneumonia sometimes seems to precipitate it, a gallbladder infection may be associated with intensification of the disease Any associated illness aggravates the arthritis but is not causative Appropriate treatment suppresses the superimposed effects

An interesting facet of rheumatoid arthritis is that many patients with the disease who become pregnant or happen to develop jaundice (infectious hepatitis, a catarrhal jaundice) may temporarily improve The arthritis frequently seems to disappear during the pregnancy only to reappear when the pregnancy is over Likewise the patient with jaundice improves, but the arthritis returns as the jaundice abates This is an odd and unexplained aspect of clinical behavior of rheumatoid arthritis It offers avenues of speculation and research into possible cause as well as treatment.

It is obvious that the cause of rheumatoid arthritis remains unknown Further study and research will surely establish its cause or causes in the reasonably near future

Behavior of Rheumatoid Arthritis

Rheumatoid arthritis may begin at any age from infancy to senility Statistical studies show that the possibility of developing the disease increases progressively for men and single women with each five year group from 15 to 54 years of age. Many patients show preceding strain, emotional or physical, prior to onset This is not always so Other predispositions are related to heredity, body build, poor diet, allergy, geographical environment, occupation, and climate Present belief is that none contributes directly to onset of the disease

Current concept of duration is that the disease is lifelong and

that although it may become so quiescent as to be no problem, it remains present. Some think of it as a "rheumatic iceberg" with only a small part of it showing above the surface as symptoms and signs. As the "iceberg" melts steadily, less of it is visible until it may almost disappear, yet no matter how small it becomes the bulk of it is still below the surface One day the cause and ways and means of melting the entire "rheumatic iceberg" will be discovered

Rheumatoid arthritis may begin insidiously or abruptly and severely. It starts abruptly in only 10 per cent of the patients Onset is not predictable. Symptoms may be present for months or years, consisting only of ease of fatigue, weakness, and mild morning stiffness Rarely there are chills and fever Mild symptoms have usually been present for weeks, months, or years before definitely recognizable phases of the disease appear

The symptoms of rheumatoid arthritis are mainly problems in pain Loss of appetite, weight loss, and mild fever are common Numbness and tingling, stinging, and burning sensations of fingers and toes occur

It may begin in any joint but most commonly in small joints of the hand other than the end joints of the fingers The progression of joint involvement is often from joints at the periphery (that is, fingers, hands, wrists, elbows, feet, ankles, knees) toward joints more centrally located in the body. Finger joints become in turn swollen, tender, hot, and red Pain is aggravated by movement Rheumatoid arthritis produces widespread abnormalities in many tissues of the body However, joints are the main site of changes and attract attention of both doctor and patient. Muscles, nerves, tendons, bursae, and skin, more rarely kidneys, heart, lung, and spleen may be abnormal The last are quite uncommon and are only mentioned here to illustrate the widespread nature of the disease. Symptoms at onset and afterward are usually related to the joints.

Knees may be the first joints affected, then, in decreasing order of incidence, fingers, wrists, ankles, feet, elbows, and shoulders.

When the disease is established, *symmetrical joint involvement is characteristic* When the first knuckle joint on one hand is involved, one can be reasonably sure that the same knuckle joint on the other will be involved This is a means of identification, useful in diagnosis

The other-than joint manifestations of rheumatoid arthritis exemplify its generalized nature These manifestations are revealed not only by constitutional symptoms such as weight loss, fatigue,

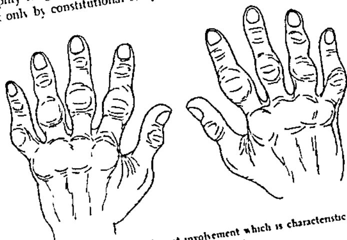


Figure 4 Symmetrical joint involvement which is characteristic of rheumatoid arthritis

fever, and weakness but also by other common changes For instance, hallmarks of rheumatoid arthritis are little lumps, gristly in character, that appear under the skin The most common location is about the elbows although they appear in other places They are nontender and show no heat or redness They are called subcutaneous nodules or rheumatic nodules (see Fig 2) Tendon sheaths and tough membranes of the palm often have these nodules They are most important to diagnosis

Unusual sweating of hands and feet with some bluish discolor-

ation is common. Sometimes one or more fingers become transiently perfectly white in cold weather. Pigmentary changes occur about nails and skin in some patients. Muscle weakness is part of the disorder and sometimes muscle wasting Neuritis may develop



Figure 5 Typical rheumato'' hand. Note joints at base of fingers M ., ,table.

with pain and discomfort, ' ralized. Mu causes stiffness and disability

A ' is the ally day goes on. period o rest st for hours

Blood tests in rheumatoid arthritis are helpful in early diagnosis. The sheep cell agglutination test is specifically positive in the majority of rheumatoid arthritis patients. The sedimentation rate is frequently elevated (a blood test). Anemia is a part of the disorder. A blood component called serum protein is abnormal with an increase in one of the proteins which is called globulin.

Fluid collecting in joints is abnormal. Joints normally contain some fluid; this increases in amount and becomes abnormal in chemical and physical characteristics in rheumatoid arthritis. Much work related to studies of cause has been done on joint fluid, and it is a major approach by researchers. Recognized x-ray abnormalities are noted; thinning of bone is seen, and little punched-out areas in bone of involved joints are observed; these are unimportant save for their usefulness in diagnosis and prognosis.

In summary, this discussion of rheumatoid arthritis is written not as an aid to self-diagnosis; such can only come to grief. Its purpose is to educate patients and families. It is important to know what doctors know—and what they do not know about rheumatoid arthritis. The patient with rheumatoid arthritis can achieve maximum benefit from proper treatment only if he knows the characteristics of his illness. We all fear unknowns. When the unknown becomes known, it is not as serious a problem as it was thought to be. Rheumatoid arthritis may be temporarily interrupted in its course for reasons not yet understood. *No patient can ever be said to be beyond help.* If a severe attack occurs in the fluctuating course of the disease, treatment is changed and intensified; certain drugs are available now to suppress the acute recurrence; the comprehensive treatmen program is modified in adaptation to the changing needs.

Often enough, after a series of attacks of varying severity, the disease "burns itself out," as doctors say. This means that attacks become milder and farther apart, finally ceasing altogether. This does not imply that cure has occurred; rather it represents the natural history of the disease in many patients.

ation is common. Sometimes one or more fingers become transiently perfectly white in cold weather. Pigmentary changes occur about nails and skin in some patients. Muscle weakness is part of the disorder and sometimes muscle wasting. Neuritis may develop



Figure 5 Typical rheumatoid arthritis hand Note joints at *base of fingers Most of this is preventable*

with pain and discomfort, localized or generalized Muscle spasm causes stiffness and disability. Pleurisy may occur

Another characteristic is unusual stiffness in the morning, gradually easing as the day goes on This follows any period of prolonged rest and may persist for hours afterward

cessively at all There is a clear familial incidence, although this is not constant. Degenerative joint disease occurs so commonly during the menopause that some unidentified endocrine influence has been suspected Animal experiments show that pituitary gland hormones have an effect on regeneration and maturation of cartilage

Weight-bearing joints are most often involved, but end joints of the fingers are also commonly enlarged The joint at the base of the thumb near the wrist is frequently tender and painful for a time Degenerative joint disease manifests no general symptoms such as weakness, fatigue fever, or involvement of tissues other than cartilage and bone The lining tissue of the joint may be somewhat congested and swollen but is not inflamed as it is in rheumatoid arthritis Temperature within the joint is slightly elevated with use and it cools only slowly during inactivity This may, in part, explain the pain This is contrary to the case in rheumatoid arthritis

The incidence is no greater in one climate than another It is commonly thought that occurrence of degenerative joint disease is far more frequent in cold or wet climates This is not at all the case It occurs with the same frequency in tropical, temperate, or cold northern zones

Degenerative joint disease has been known as far back as man has recorded his experiences Considerable understanding of its cause has been accomplished by extensive research and painstaking observation There are still many unanswered questions, but generally this disease is understood

Degenerative joint disease usually causes no symptoms and is noted incidentally on medical examination for some other reason It is a gradual, insidious process Alterations in cartilage and bone in degenerative joint disease make their earliest appearance in the twenties, increasing in frequency and severity with advancing age Even with most extensive abnormalities revealed by x-ray examination the patient may be without symptoms It is not what the

The future for arthritis patients is bright with the dawn of modern treatment and scientific research. Cure may one day be forthcoming, and, until then, treatment offers relief and prevention of crippling and deformity.

Treatment is considered in Chapter 6.

DEGENERATIVE JOINT DISEASE

Degenerative joint disease has many inappropriate synonyms, the most common being osteoarthritis Inflammation, heat, and redness occur only late in the disease and then are uncommon The suffix, "itis" (inflammation), is inappropriate. It has been called senescent arthritis, which is also inappropriate because it can occur at most levels It is much more common in people past middle age Hypertrophic arthritis, another poor name, suggests both inflammation and bone and cartilage overgrowth. Only late in the course of the disease does bone overgrowth occur, actually cartilage becomes thinned, irregular, and roughened.

Degenerative joint disease is a chronic rheumatic disease characterized early by fraying, splitting, microscopic fissuring, and breaking down of cartilage with late overgrowth of bone and cartilage Pain is the principal problem although this symptom appears only after many years of disease Characteristic pain occurs on use and is relieved by rest It has been erroneously called a disease of "wear and tear," occurring chiefly in older individuals There is little doubt that sudden injury or the repeated minor "injuries" consequent to joint use over the years constitute a major factor in causing degenerative joint disease, but there is equally no doubt that other factors are involved Knock-kneed, middle-aged, obese women who have overloaded their weight-bearing joints by many extra pounds for many years do have the disease; however, it also may occur in men who walk no more than a block a day. Finger joints may be involved in pianists and typists, but extensive disease may also occur in those who have not used their fingers ex-

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x-ray picture looks like that counts, it is how the joint works and feels. Degenerative joint disease is largely a consequence of the many repeated minor injuries consequent to weight bearing and activity acquired over the years (ordinary wear and tear of joint use). Cartilage then is degenerated rather than inflamed. One patient decried, "But I'm not degenerating, am I?" And she was not! Only her cartilages.

A peculiar aspect of this rheumatic state is that many people have extensive abnormalities in their joints but no symptoms Others with minimal joint alterations are afflicted with considerable pain No satisfactory explanation is available. It has been estimated that the disease is universally present beyond the age of 40 but that only about 5 per cent of all people have symptoms.

The end joints of the fingers are commonly affected Joints other than weight-bearing joints are not commonly involved Why this occurs is unknown. There is little wear and tear to end joints of fingers compared to weight-bearing joints. Many theories have been advanced in explanation These include glandular abnormalities, disturbances of joint circulation, infection, heredity, and aging Such contribution may be important in individual cases To decide how much is the physician's function

There seems little question that chronic irritation to a joint can and usually does produce this disease Experimentally knee joints of dogs develop degenerative joint disease with repeated minor injuries. Chronic irritation may result from chronic strain due to excess weight and poor posture, dislocations or fractures near or into joints, damage resulting from old infections which are healed and cured, repeated minor injuries, or occupational injuries repeatedly occurring in laborers. All these may lead to degenerative joint disease.

Extent of cartilage degeneration varies tremendously among individuals This may be due to the quality of inherited cartilage versus the magnitude of the wear and tear The best "rubber" presumably would wear longest before degenerating.

As the disease is developing, cartilages first soften, roughen, with tiny microscopic splittings Small crevasses, clefts, and fissures appear in the cartilage. Joint surface of the cartilage is gradually eroded and finally worn down thin Erosion proceeds irregularly; the surface is uneven, and the cartilage layer varies in thickness. Finally the bone beneath the cartilage is exposed To compensate and bear the strain the bone becomes more dense and coalescent. On x ray films, this process is termed eburnation Later, healing regenerative efforts begin in the vicinity of clefts and fissures Increase in growth of bone follows Bony overgrowth which is called marginal proliferation, spurs, lipping, osteophytes, or exostosis develops about the joint This bony overgrowth may be felt about the margins of the joint *It is not at all established that the bony spurs and lipping actually produce any pain* An amusing jingle suggests that this is so but this is doubted by most rheumatologists. "When fringes on hinges impinges it twinges" These ominous-looking spurs probably appear much more painful than they are

Healing is a major problem because cartilage is the slowest healing tissue in the body It has little blood supply and heals slowly and ineffectively, if at all. The primary site of involvement in degenerative joint disease is the cartilage, cartilage is only secondarily involved in rheumatoid arthritis This is a fundamental point of difference in the two diseases

Symptoms and Signs

Symptoms of degenerative joint disease are referable only to joints The patient does not feel "sick" all over as is at least intermittently so in rheumatoid arthritis Pain is the main manifestation, aching in character, rarely intense Pain is often intensified before weather changes Stiffness, or as one patient has said "joint jelling," occurs on rest Stiffness is, however, of short duration, persisting only a few minutes Rheumatoid arthritis patients have more intense stiffness persisting for hours after a period of rest of any duration

Joints may show some enlargement, localized tenderness, and a grating or creaking sensation on movement. Little heat, redness, or swelling occurs. The enlarged joints feel hard to the touch. There is usually no fluid accumulation in the joints as in rheumatoid arthritis.

Degenerative joint disease is commonly a disorder of middle or old age. However, it does occur at any age. Men are more frequently

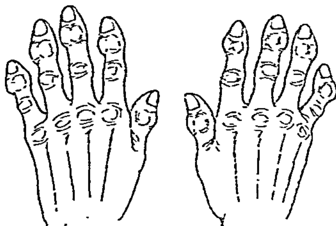


Figure 6. Finger joint involvement which is characteristic of degenerative joint disease.

afflicted than women, probably because they are more exposed to injuries and continual weight bearing. Oddly ... joints of the fingers are more often involved in women. ...

Weight-bearing joints (knees, hips, ankle ... the spine of the neck and ... and the end j... are the joints most ... olved and in ... knuckles are ...

The x-ray ... diag... er, i ... extensive ... w ... tests ...



Figure 7 Typical finger joint involvement in degenerative joint disease

occurs in the sedimentation rate as in rheumatoid arthritis. Anemia is not present Agglutination reactions of blood used in identifying rheumatic diseases are all normal. Blood chemistry is likewise normal All these tests show that the disease is not a generalized or systemic disease It involves only joints and does not make the patient otherwise ill

Enlarged end joints of the fingers are called "Heberden's nodes," because Heberden, a famous British physician, first described the[m]. There is a cartilaginous and bony enlargement of end joints o[f] the fingers It may interfere with finger flexion and extension Heberden's nodes may follow injury to the finger. It is usually generalized in all fingers Development of the end joint disorder is insidious, gradual, and usually painful. In rarer instances it occurs rapidly, with redness, swelling, tenderness, and aching. Numbness, tingling of the finger tips, and clumsiness on use are common complaints When severely involved, they usually continue to be troublesome for months to a few years, subsiding spontaneously. They remain enlarged but ultimately become pain free.

Weight-bearing joints, especially the knees and hips, cause th[e] most trouble. Practically the only crippling, and quite disabling, manifestation of degenerative joint disease is that occurring in the hip joint. Advanced degeneration of the cartilage may occur finally, resulting in a rigid, fused hip joint. With early recognition, crippling is preventable

An odd feature of degenerative joint disease is rib joint involvement. This is not surprising, rib joints differ from other joints in that they never rest during life. The chest moves continually with breathing With this kind of joint use it is not surprising that degenerative joint disease develops in these joints

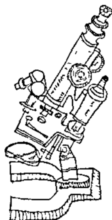
In summary, the patient with degenerative joint disease is usually a middle-aged or elderly person who has only a few affected joints Those most frequently involved are the end joints of the fingers, the lower spine, knees, hips, and the joints in the neck. Wrists, elbows, knuckles, or feet are rarely affected. There is no joint

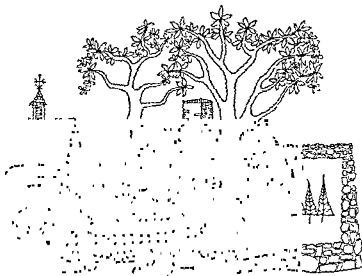
swelling Symptoms are uncommon before the age of 40 unless due to specific joint injury

Onset is so gradual that it goes unnoticed The patient is commonly overweight and of short, thick body build No systemic manifestations occur such as fatigue and weakness, fever, loss of weight, anemia, and enlargement of glands or spleen as are seen in rheumatoid arthritis

Main symptoms are minor stiffness and pain on motion which is relieved by rest but is worse on prolonged activity Stiffness is relieved by "limbering up" exercises

Treatment is considered in Chapter 7





Chapter 6

HOME MANAGEMENT OF RHEUMATOID ARTHRITIS

GENERAL INFORMATION AND INSTRUCTION

Rheumatoid arthritis is the most important of all rheumatic diseases The term arthritis means inflammation of joints. However, rheumatoid arthritis is more than a disease of joints; it involves many connective tissues of the body resulting in muscle spasm, tendon shortening, neuritis, anemia, cold finger tips, weakness, fatigue, and occasionally fever. These features testify to the generalized nature of the disease. It is, of course, the joints that are painful, hot, and red, joint manifestations are responsible for any crippling that occurs. It should be apparent then that treatment,

o be effective, must be directed at the total patient and all con-
ective tissues, including and with special care for the joints. The
comprehensive home care program favorably influences the over-
all disease and its consequences

In rheumatoid arthritis as in other significant illnesses we turn hopefully to the doctor for a pill or an injection In the modern mid-century of miraculous medicine, we demand that a miracle drug be produced We have seen the development of such great preventive weapons as smallpox vaccine and diphtheria toxoid We watched many infectious diseases eliminated by the sulfonamides and penicillin But at present curative drugs have no effect on noninfectious diseases There are some lifesaving, though far from curative drugs, such as insulin for diabetes and liver extract for pernicious anemia They do not eradicate the disease but rather keep it under control for as long as treatment is continued

The picture is, for the present, not so fortunate in rheumatoid arthritis There are drugs to relieve symptoms but none to cure the disease itself Arthritis is a rare cause of death, it usually does not shorten life, but it probably causes more discomfort, pain and crippling than any other of mankind s diseases Although medical science and research have not yet turned up a specific treatment or cure, most of the painful disability is preventable today Untreated rheumatoid arthritis may, but should not, produce scarring of joints and permanent crippling

The absence of specific drug treatment for arthritis need not be discouraging It does not mean that the rheumatoid arthritis patient becomes crippled and confined to a wheelchair In fact, quite the contrary, the great majority of patients with this disease need not lose time from work This is feasible with the simplest, inexpensive, but most effective treatment—the complete comprehensive home care program

The permanent crippling effects of arthritis develop very slowly, even in its worst form, the disease constantly fluctuates in severity,

with days, weeks, or months of decrease in symptoms or freedon from them When pain and spasm decrease or disappear and the mobility of joints is temporarily increased, treatment can be much accelerated and losses recouped. Thus, crippling is prevented, and the patient can carry on with normal activities Maintenance of joint mobility is of the utmost importance since in many cases the disease eventually "burns itself out," though it is not cured.

The aim of the comprehensive home care program is to keep the disease at as low a level of inflammation as possible all the time, to keep the joints mobile and the patient in fit condition to use them Proper treatment varies from one patient to another and from one time to another in the same patient. The treatment program must be modified from time to time depending on the changing manifestations of the disease. At one time the pain and swelling may be intense and the disability great; home nursing care, physical therapy, exercises, and drugs may all be rescheduled. Much more time, effort, and judgment are necessary when the disease is more active It can entail considerable sacrifices by the family

At another time there is very little disturbance, and the disease is only a minor inconvenience. Thus, a program suitable and appropriate for a particular patient may be quite inappropriate months or years later Lack of understanding of the course of the disease and unnecessary worry about a possible dark future can result in disastrous psychological complications. Discussions between patient and physician regarding what is to be expected bring reassurance and peace of mind, aiding immeasurably in assuring a successful outcome

Treatment may begin in a hospital with expert advice and training in home care A special regimen is designed to fit the particular patient's case Both patient and family must be indoctrinated into the nature of the problem of arthritis, the treatment technique, and the particular aspects of the patient himself. Experts in rehabilitation and physical medicine may be consulted, instruc-

tion in proper alternation of rest and exercise, supervision of use of drugs, splints, heat—all these are done. The doctor is responsible at first, then as patient and family become skilled and experienced, the doctor allocates more and more of the details of treatment to their responsibility. Follow-up visits are necessary to evaluate progress or detect lack of it and make corrections. In a field as rapidly developing as rheumatology, doctor or clinic visits are needed to assure taking advantage of new developments.

ADVICE TO THE VERY ILL PATIENT OR SPECIAL CASE

A small number of patients with rheumatoid arthritis have quite severe disease associated with a rapid course, extreme exhaustion, fever, and extensive pain and swelling. This is a special problem requiring the most expert care and evaluation. In the hands of a few doctors who have devoted many years to the study of arthritis, such cases may be successfully managed. It would be unwise, indeed, for a severely ill patient to embark on the comprehensive program here outlined. Such patients require frequent and special observation, judicious prescription of drugs, carefully made rest splints, and, in most instances, hospital or sanatorium care.

If the patient and his doctor find the arthritis is severe, extensive, and rapidly progressive, or does not respond to the treatment given, it is advisable to seek care in one of the centers for study and management of rheumatic diseases. Such a center can be located by writing to one of the major agencies or their local representatives, which devote themselves to arthritis (see Appendix II). Information is most promptly obtained by contacting the officials of the local chapter of the Arthritis and Rheumatism Foundation. Often enough the most specialized care can be provided at the least possible expense by following the advice of these agencies.

There may also arise special problems in diagnosis or rehabilitation of the arthritis patient requiring very detailed advice and

more extensive studies and examination than may be available in the physician's office or the small hospital. Clinics and physicians specializing in rheumatism are glad to provide such help The list of clinics on pages 187-201 may be helpful in selection. This move is a very important one to the patient with special problems

Such a common rehabilitation problem as unstable, "wobbly" knees requires very special advice and care, ill-advised weight bearing, exercises, and physical therapy may cause disastrous consequences to these all-important joints. In certain instances, precise identification of the type of arthritis present poses a serious problem, an arthritis center is staffed by physicians specially trained in such identification, and laboratory techniques and equipment are available to aid in diagnosis. Rather frequently the patient may improve in his general health but a few joints continue to cause disability. In this instance, properly made splints often solve the problem Their construction and fitting require special training and individualized care

These paragraphs are included in order that physician and patient may know where to turn if and when the arthritis seems out of reasonable control There is specialized help now available in many areas.

EDUCATION

An important aspect of treatment of rheumatoid arthritis is education about the nature of the disease (see Chaps 2 and 5). Treatment at home is sound and rational in the light of this knowledge Responsibility for treatment, ultimately, devolves on the patient, not the physician. The doctor's job is to achieve definitive diagnosis, then he instructs the patient in home management, visits and re-examines the patient at intervals, advises him regarding rest, home heat treatments, need for hospitalization, medicine, and exercises. Treatment is as effective at home as elsewhere Hospitalization for a period of instruction and training is

helpful Frequent visits to home, hospital, or office for training in treatment methods and aims are especially useful at first.

An attitude necessary to success is to know that there is no short cut to proper treatment, treatment by present knowledge is lifelong For many years a few physicians, intensely interested in and enthusiastic about treatment of rheumatoid arthritis, have successfully managed it Most patients have, for short periods, tried parts of the comprehensive program They may not have appreciated that it must be done regularly, and, as we now know, forever Patients are usually initially skeptical of the effectiveness of the comprehensive treatment *Only those who refrain from using their own abilities to a maximum remain skeptical* It has been truly said that the vast majority of rheumatoid arthritis patients have much more ability than disability The objective of treatment is to return the patient to his maximum physical, social, and economic status within realistic limitations of any disability he may already have acquired, but at the hilt of his capabilities

Effects of various drugs are often overrated Any treatment usually has a transient period of initial success settling later into true perspective It is so easy to be enthusiastic about a drug treatment used for only days, weeks, or months Disappointment is keen following early rising hopes and joy of improvement, but this is the usual pattern, and it is best to know all about it When cure becomes available there will be no question about it

Successful management of rheumatoid arthritis depends not on any one treatment effort, but rather on a broad comprehensive program utilizing all available knowledge of the disease and the several predictable ways of favorably influencing its course No remedy is known which will regularly and completely arrest or cure rheumatoid arthritis

Of course, it would be so pleasant and easy if we had a miracle drug for prevention and cure of arthritis, but we do not! Maybe some day, but not now Arthritis is here now, doing its damage Until the day cure is available there is very effective treatment

Chemical abnormalities observed in rheumatoid arthritis have been misinterpreted, resulting in ill-advised diets. The amount of protein has been both increased and decreased. The amount of carbohydrate was once reduced because of evidence of increase in blood sugar concentration in rheumatoid arthritis. This, in fact, may result in muscle wasting and loss of strength. No indication exists that disturbance of sugar chemistry in rheumatoid arthritis justifies limitation of carbohydrate intake.

Both low- and high-calcium diets have had transient popularity in the long history of arthritis treatment. Painstaking experiments in animals and man demonstrate neither excess nor deficiency of calcium in rheumatoid arthritis provided there is a reasonable amount of calcium in the diet. Calcium itself has nothing to do with rheumatoid arthritis except what it has to do with bone and tissue chemistry in all persons.

Low-salt diets have been used and discarded many times over. Restriction of salt is unnecessary. The net effect is to make the diet unpalatable, ultimately producing more harm than good.

More protein is needed by the patient with rheumatoid arthritis. A well-balanced diet containing more than the usual amount of protein is ideal, and the number of calories is adjusted to the patient's individual need.

Most people are amazed when the informed physician explains to them that diet is important in management only insofar as it should be properly balanced, nutritious, containing adequate calories, vitamins, and minerals, with enough bulk to prevent constipation. There is no proof that lack of any specific food is causative in rheumatoid arthritis. No evidence exists that eating food or drinking fluids in any particular order has usefulness in the treatment of rheumatoid arthritis. There have been and always will be fads and exploitations of arthritics by people who are completely honest and sincere in their efforts but sadly misguided and misinformed.

Periodically theories appear, unbased in fact, that the taking of various types of vegetable or animal oils will "oil the joints"

and make the patient well There is no oil in joints, and unfortunately it is not as simple as greasing a machine The substance in joints is viscous but is far from being an oil The viscous fluid in joints is a very complex sugar combined with a protein, it is called mucin

Patients with rheumatoid arthritis who have lost weight need a high-caloric intake If one is overweight, starches and carbohydrates are restricted and a low-caloric diet prescribed The most important types of foods are fresh green vegetables, fruits, milk, meat, and dairy products

Vitamin capsules are used They have a place even though there is no specific effect on the arthritis credited to any vitamin Prolonged use of large doses of vitamin D is condemned, such treatment creates a disease of greater magnitude than the arthritis itself Vitamin D is in cod liver oil Indiscriminate and excessive use elevates the amount of calcium in the blood, resulting in significant kidney damage This has happened in the past and will probably continue to occur in the future As long as poorly informed, albeit honest and conscientious people propose and initiate treatment, unfortunate events will follow

One or 2 ounces of cod liver oil morning or night are useful, intermittently administered, in patients greatly underweight. This supplies vitamins A and D It may be taken for three months and then omitted for three months Cod liver oil is taken in many forms, as pure oil or capsules It is needed most in the winter when exposure to sunlight is minimal

A full glass of orange juice daily provides adequate quantities of vitamin C In general, this is a better form than pills or capsules In those with a poor food interest multiple vitamin capsules may aid in improving appetite and feeling of well being Vitamin B_1 (thiamine chloride) is especially helpful

The rheumatoid arthritis patient should not be so overloaded with medications as to upset his digestion, decreasing dietary intake or causing nausea and vomiting

An average daily diet might contain two or three glasses o

milk, several glasses of fruit juice or tomato juice, meat, sea food, or fowl, cheese, fresh green vegetables, butter, cream, and eggs, and any additional foods chosen by the patient provided they contain sufficient calories to maintain weight. Meat is necessary, being the richest source of protein There is no reason to restrict any food or class of food from the diets of people with rheumatoid arthritis unless they obviously cause indigestion or the patient is allergic to them The order in which food and drink is taken is that which pleases the patient most.

Climate and Rheumatoid Arthritis

Exposure to cold, dampness, and drafts results in increased pain and stiffness in patients with rheumatoid arthritis; but it has not been proven that a warm, dry climate has any particular benefit for arthritis If one has an easy choice, such an environment is obviously more comfortable The living is easier with or without arthritis The point to be made is that treatment of rheumatoid arthritis is fully as satisfactory in the coldest sections of the United States as it is in the warmest, semitropical areas. The fundamental course of the disease is unaltered by climatological factors.

It is commonly stated that rheumatoid arthritis is rare in the tropics, the truth is that this has not yet been established Though a patient may move to a warm, dry, semitropical climate, his arthritis must be continually treated as it is in a temperate or cold climate Supervision by a well-informed person is necessary. At the very most one can say that not enough is known about the effect of climate on rheumatoid arthritis to suggest that patients make a financial sacrifice or give up their jobs to move to a warm, dry climate.

Most sought-after climates in our country are those in Florida, Arizona, and southern California Doctors who have investigated rheumatoid arthritis for many years disagree on advisability of such an environment A high percentage of patients with rheumatoid arthritis sent to these areas do not improve. Consequences

of sending patients to semitropical climates is frequently disappointing. Whatever the advantages of warm climates are, they are often outweighed by certain disadvantages such as financial hardship, loss of job, and uprooting of social and family ties The patient may not live as well, may not receive as good food or personal medical care as at home Such facts enter into the decision regarding change of climate

Rheumatoid arthritis occurs in all parts of the United States as well as the tropics If a patient's financial status is such that he can live as comfortably and have as good medical care as at home, without homesickness, then transfer to a warm, dry climate is justifiable

SUMMARY OF FACTS ABOUT RHEUMATOID ARTHRITIS

As one approaches treatment of his own arthritis there are several points to keep in mind

1 The chances of improvement are great, the majority of patients are able to return to a productive fairly comfortable life with gainful employment

2 There is no cure for rheumatoid arthritis in the sense that it disappears with treatment However, treatment is predictably effective, success depends on the enthusiasm and thoroughness with which patient and family approach it

3 Justification exists for optimism and confidence concerning successful ultimate outcome in the search for cure in rheumatoid arthritis This is a genuine, honest optimism, much effort is being put forth today in research in rheumatoid arthritis (See Chap 9) Great progress has been and continues to be made

4 Treatment in the light of present knowledge is lifelong, the magnitude of the treatment program may vary It is unwise to begin treatment with the thought that it is only for a few weeks or months It is necessary to assume that it will require many years

of effort Exceptional cases have extraordinary results in a few weeks, this is uncommon and hardly the rule Realizing at the outset that progress often occurs in months and years, not days and weeks, prevents keen disappointment.

5. The patient works out a plan or general scheme of treatment fitted into his day This must be done with physician guidance and advice Such a program is modified by the severity of the disease, employment, family situation, availability of physicians or clinics devoted to the treatment of this disease, and the availability of hospitals or home training programs in physical therapy.

Arthritic patients cannot be willing to sit back and wait for the doctor to produce cure. Such is not, nor is it likely to be, available within the immediately foreseeable future. Each day is planned to include proper exercises, balanced by adequate rest and many family or self-applied home physical therapeutic measures, and diversional activities as well as medicine. If the patient becomes thoroughly convinced of the necessity and importance of his own part in treatment he will have a predictable, satisfactory result. He is an active partner in the treatment program, not a passive recipient

6 There is no pill, capsule, injection, or combination of medicines as yet known that will cure rheumatoid arthritis It is easy to be duped by what is read in newspapers or heard from friends regarding cures of rheumatoid arthritis When such "cures" are explored and studied, they were in patients who did not have rheumatoid arthritis, or they represented the exceptional case in which the disease became better or disappeared for months or years for no known reason, only to recur. It is difficult to judge what course the disease is taking when its natural duration may be 40 to 50 years.

7 Rheumatoid arthritis in its natural course consists of a series of increases in activity, symptoms increase in intensity, mildly or severely, followed by remission with decrease in pain, swelling and disability The program outlined will diminish the severity and frequency of recurrences as they come along

8. Treatment varies with the stage of the disease Often the

amount of treatment can be liberalized Even during treatment, response varies from week to week, and minor set backs occur in most patients Lastly, it is important to realize that rheumatoid arthritis is much more than a disease of joints, and, hence, the *total* treatment program is effective whereas any single measure or measures directed only at joints cannot be helpful or predictable in effect

DRUGS USEFUL IN RHEUMATOID ARTHRITIS

ASPIRIN AND OTHER SALICYLATES Though drugs are only one aspect of treatment they are discussed first The most important medication in rheumatoid arthritis is acetylsalicylic acid or aspirin The only objection to aspirin is that it occasionally produces stomach irritation This is easily overcome by timing dosage with meals taking it with or after meals The most frequent mistake is taking too little and not often enough In proper dosage aspirin is safe, cheap, and well tolerated by most patients Aspirin, by relieving pain, aids in suppressing rheumatoid arthritis in practically all patients However, treatment of the disease requires much more than intermittent doses of aspirin The salicylate drug family, of which aspirin is a member, is of first importance in drug treatment

Some rheumatologists believe that the salicylates play a role beyond that of suppression of pain This point is unsettled There is evidence to support the theory that aspirin participates in repair of connective tissues all over the body However, this is not proven Salicylate reduces pain and thus relieves muscle spasm The minimum dose is 2 tablets four times a day, and many patient may take from 12 to 20 or more tablets daily

Salicylate is best taken during or after meals Coated table may be used if stomach irritation is annoying although plain ta lets are preferable * People with bronchial asthma or ulcers

* Some coated tablets may not be absorbed from the intestine as we plain tablets This difficulty may be overcome by the manufacturers

the stomach or small intestine should use salicylates only after consultation with their physician. The effective dose of aspirin required to suppress inflammation is relatively high, in fact, close to that which produces toxic symptoms. The narrow range of dosage between effectiveness and toxicity requires that the arthritic have careful supervision by a physician. Aspirin (salicylate) treatment like any other drug therapy requires physician supervision. The patient soon learns how to adjust his dose to accomplish suppression of inflammation in connective tissues and still not produce annoying toxic symptoms, e g , nausea and a severe ringing in the ears It is fortunate that the aspirin group of drugs is safe and inexpensive The most common cause of failure to suppress rheumatoid arthritis is improper spacing of doses and inadequate total daily dosage.

The pain-relieving qualities of salicylate are important. Pain prevents proper rest, decreases appetite, and interferes with rest, sleep, and exercise which are important factors in the recovery process

Patent medicines now available for arthritis contain aspirin or other salicylates, aspirin-like drugs such as phenacetin, or aspirin derivatives such as the gentisates No patent medicine works better than plain aspirin—for they owe any efficacy they have to the aspirin-like drugs they contain. No substance in any patent medicine now on the market offers any new principle of treatment.

FERROUS SULFATE (IRON). Preparations of iron, ferrous sulfate, are always worth a trial in an effort to correct the anemia sometimes accompanying rheumatoid arthritis In general, women are more likely to be improved than men The anemia may be resistant to iron replacement.

The precise cause of the anemia of rheumatoid arthritis is not known, it seems likely that it is a result of failure to manufacture red blood cells in the bone marrow. Folic acid has been found to be helpful in some patients Liver injections are of no benefit in treating this type of anemia

BLOOD TRANSFUSION. Blood transfusions given periodically are

of value in initiating the recovery process, particularly if anemia is present. Beneficial results accrue other than the correction of the anemia by blood transfusion, the mechanism is unknown.

Sedatives and Narcotics. In instances of severe joint pain, codeine, a narcotic, is periodically useful. However, it must not be taken regularly or indefinitely because of the possibility of addiction. Treatment of a chronic disease with narcotics is only intermittent and with specific need. This and similar drugs are used only on prescription by a physician.

Sedative medicine such as phenobarbital is helpful to allay nervousness, anxiety, or sleeplessness. Newer drugs such as chlorpromazine (Thorazine®) or meprobamate (Miltown®) may have an occasional place in the treatment of rheumatoid arthritis. Hypnotic drugs and sleeping pills are used only when insomnia is a real problem.

Gold Salt Therapy (Chrysotherapy). Salts of the metal gold have been used for over 30 years in the treatment of rheumatoid arthritis. Nearly all rheumatologists who have given gold therapy an adequate trial believe that it is an effective agent and an important adjunct to comprehensive treatment. It is used extensively in many clinics. Gold is the only remedy, other than the salicylates, that has "survived the blizzard of clinical criticism."

The preparations of gold salts used contain about 50 per cent of the metal. It is given by injection, usually at weekly intervals. The gold accumulates in the body and is slowly excreted. It is generally thought that a certain level of accumulation of the medication is necessary to achieve suppression of the arthritis. The mechanism by which this occurs is unknown. Improvement occurs gradually. No change is expected for several weeks of injections when remission and subsidence of the inflammatory joint disease may occur. The systemic symptoms of fever, fatigue, and weakness usually decrease at the same time.

Gold is given only with close physician supervision. The aim of therapy is to administer enough gold to build up a level of the

metal sufficient to induce a remission of the arthritis; and then continue the injections weekly to maintain that level until a permanent remission is established. This is not always achieved. Treatment is continued for many months and sometimes for years.

There are occasional undesirable reactions to gold salts which make it mandatory that a skilled person administer it. Itching of the skin and a rash sometimes occur. Sore mouth and tongue are occasionally annoying. Such reactions may require that the injections be stopped for a time and then started again. There are very effective medicines now available to counteract the undesirable effects of gold. It is a drug to be respected but not feared. Liver disorders contraindicate the use of gold, tendency to drug allergy is often the reason to avoid its use.

Specialists in rheumatology are not yet in agreement regarding the precise place of gold in treatment. It is an individualized treatment, and the physician or clinic makes the decision for its use. Some doctors feel its main use is in very active rheumatoid arthritis which has not responded to initial treatment. The most favorable response to gold treatment seems to occur in patients who have had the arthritis less than a year. However, it may be successfully used at any stage.

STEROID HORMONES. A group of hormones which have been biologically and synthetically prepared have a prompt influence on symptoms of rheumatoid arthritis Such hormones or their close relatives are normally produced in the pituitary and adrenal glands These drugs are, by name, ACTH (adrenocorticotropic hormone), hydrocortisone, cortisone, and prednisone (Meticorten®), prednisolone (Sterane® and Medrol®), and triamcinalone (Aristocort® and Kenacort®). They are all closely related, all have an anti-inflammatory effect.

Soon after the discovery and preparation of ACTH and cortisone, they were prematurely thought to be specific cures for arthritis As experience accumulated, these hopes were dashed.

Unfortunately they and their later family members, prednisone and prednisolone, are just another means of controlling symptoms of the disease They clearly do suppress inflammation and enhance the patient's feeling of well-being However, patients treated only with these agents, although initially improved, usually relapse after cessation of therapy The hormones probably do not influence the ultimate course of the disease. They are limited in their ability to alter the fundamental disease process

Steroid hormone administration results in a chemical or metabolic change decreasing inflammation, heat, redness, and swelling The greatest problem is that in sizable dosage they cause an abnormal state of the glands of internal secretion, necessitating stopping the medicine This difficulty is overcome by administering small doses spaced at intervals throughout the day

A sufficiently long experience has not been had with these hormones to know their ultimate effect Many questions regarding them remain unanswered Research and investigation up to the present have not proven the ultimate usefulness or importance of steroid hormones in management of arthritis patients The new hormones, prednisone and prednisolone, have a greater anti-inflammatory activity than their relatives cortisone and hydrocortisone They have presently been investigated only two and a half years They have the same hormonal effects as the others

These antirheumatic hormones have a definite place in the treatment of rheumatoid arthritis In certain patients, better relief may be obtained when small doses of the hormones are used intermittently, in conjunction with aspirin continually, than where either is used alone Both are clearly more effective in the setting of the comprehensive program The characteristics of the individual case of rheumatoid arthritis are considered in deciding whether or not the hormones are indicated They may be very helpful in some instances and not so in others The hormones are sometimes taken continually in small, spaced doses The aim is to provide enough of the drug to partially suppress the arthritis but not enough to

cause the undesirable side effects. Doses sufficient to thoroughly suppress the inflammation are usually too large to avoid the unwanted hormonal influences. Adjustment of dosage requires considerable judgment and experience. Dosage may be increased or decreased from time to time depending on the course of the disease.

The hormones often have a dramatic and immediate effect which is unduly encouraging. When properly used, they are very helpful, but as with any powerful drug, judicious appraisal of indication for use is necessary. In instances of severe rheumatoid arthritis characterized by fever, loss of weight, extreme pain, swelling, and heat the hormones may play an important part for a certain period of time. Specific complications of rheumatoid arthritis may yield satisfactorily to temporary use of these hormones. Occasionally during extreme stress such as accidental injury, major surgery, or some rehabilitation procedure, the patient may be aided by use of these hormones. Such drugs should never be taken other than under the guidance of a physician.

A real advantage in the use of the hormones, judiciously applied, is that by temporary suppression of pain and swelling a more vigorous and effective comprehensive program with rest, physical therapy, and exercises may be possible. The course of the disease then can be favorably influenced by a more permanently effective treatment. The hormone, in a few weeks or months, can be stopped, having accomplished its purpose. Steroid hormones have facilitated correction of deformities by physical, therapeutic, and orthopedic measures.

Local use of several of these hormones has been helpful. The injection of hydrocortisone into a badly inflamed joint has often induced remission and relief of pain, heat, and swelling in the involved joint. This procedure has greatest usefulness when only one or two joints are producing considerable disability. The hormones are used locally as drops when iritis, an inflammation of the eye, develops.

Very active research efforts are in progress in many laboratories

in the search for more potent antirheumatic hormones with less undesirable effects. With progressive refinements, the hormone preparations seem to be steadily more effective The newest hormone, hexadecadron, only currently receiving clinical trial, appears promising

In conclusion, there is no evidence that people have rheumatoid arthritis because of a deficiency of or an inability to produce hormones themselves However, these drugs have an important and effective part in the treatment of rheumatoid arthritis today

PHENYLBUTAZONE (BUTAZOLIDIN®) Phenylbutazone (Butazolidin®) is another drug used in rheumatoid arthritis It was first synthesized in 1948 as a solvent for another drug. It was soon learned that phenylbutazone had antirheumatic properties, it was first used in rheumatoid arthritis in 1951 Very significant degrees of improvement were noted Since that time it has been used to advantage in selected cases of arthritis

The drug is taken orally The favorable effects are increase in joint motion, relief of pain, improved strength, and sometimes decrease in joint swelling The exact mechanism by which phenylbutazone effects improvement in arthritis has not been determined Some doctors feel it merely relieves pain, others believe it has some unknown effect on the connective tissues generally Certainly it does not cure but seems to "dampen" the effects of arthritis

Not all people can take phenylbutazone without undesirable side effects and reactions As with so many drugs, there are occasional skin rash, nausea, diarrhea, and depression of the blood count However many patients take phenylbutazone and enjoy only the favorable antirheumatic effects In instances in which the drug has a very good influence on the arthritis but reactions occur, it is usually possible to control or eliminate the undesirable effects by use of other medicines or by stopping the drug for a short time and starting it again In general, it has not been recommended in older patients, in patients who are already having a good result

with other treatment, and in those with a past experience of drug sensitivity

Certainly phenylbutazone should never be taken except with physician supervision Many doctors have had a good experience with this drug. It is considered one of several drugs having a minor place in drug treatment of rheumatoid arthritis.

Chloroquine This drug, used in treating malaria, is currently receiving wide trial in rheumatoid arthritis Sufficient experience has not accumulated to reach any conclusions.

PSYCHOTHERAPY

Many erroneous theories have arisen regarding the cause of rheumatoid arthritis, none of which have been fully accepted because each lacks sufficient proof. There is evidence that emotional disturbances may occasionally be the "trigger" mechanism initiating onset of rheumatoid arthritis. Emotional factors cannot be identified as real cause, however, long periods of continual pain, disability, and discouragement render patients less able to cope emotionally with the disease. For this reason, institution of the comprehensive program is all the more urgent. Emotional disorders of any sort may interfere with successful treatment An understanding, well-informed physician can do much to mitigate this, the patient's family is in an even better position to be of help here

Among men patients, financial worries and inability to work are common stresses that add to the problem Loss of a parent or spouse, family worries, loss of independence, living with in laws, and marital discord all may play important roles Patients with rheumatoid arthritis may need help to correct emotionally injurious factors The arthritic, if he has not had proper total treatment, may be irritable, fretful, and short-tempered, lacking confidence in himself as well as in his physician; he may seem quite unreasonable Actually this is true of any person who has a

chronic disease, who wants to get well, be independent, but must accept limitations Such attitudes are a reflection of the frustrations encountered by people with chronic diseases This is not peculiar only to arthritis patients

Usually the patient simply needs to understand why he feels as he does, to learn what to do about it to have an effective way of dealing with it Once he understands his resentments, conflicts, hatreds, and fears he finds most or all of them can be resolved Occasionally psychiatric care is needed and helpful, but by no means should this be a regular therapeutic adjunct The rule is that an able physician and the family can deal with the great majority of emotional problems

The most common emotional difficulty is that the patient resents having any illness, especially a chronic one, feels antagonistic and has strong conflicting feelings about it, such fears and resentments are subconsciously projected on those about him, family, friends, medical attendants Medical people are those to whom he turns, if he is not helped or is not well educated about the nature of the disease and the comprehensive treatment he may come to distrust those to whom he has turned for help All this is quite reversible and preventable, but patient, doctor, and family all must understand it A constructive approach eliminates an unfavorable attitude It is emphasized that such emotional problems are commonly an expected aspect of any chronic illness that is actually or potentially disabling

Morale and belief in the efficiency of the program can be raised by careful measurement of joints, actually demonstrating decrease in swelling. Milestones of progress must be pointed out—gradually increasing mobility of stiff joints, slow change of mood toward optimism, decrease in sedimentation rate, improvement of anemia, increased sense of well being, and gradual return to work The patient may not see them unless they are actually pointed out to him. A progress notebook kept by the patient and his family is very useful

ORTHOPEDIC MANAGEMENT

Many of the deformities occurring in arthritic patients are a consequence of prolonged, sustained muscular spasm. Early in the disease this spasm can be readily overcome by using periodic rest, special exercises, avoidance of injury, physical therapy, and such supports as corsets, braces, proper shoes, and splints. However, if muscular spasm persists, contractions of the joint capsule and tendons occur. These result in deformities. Many deformities occur directly from the effort of patients or of misguided, sympathetic families to keep the joints in the least painful position. Placing a pillow under inflamed knees or prolonged flexion of other joints to keep the patient as comfortable as possible accelerates and accentuates permanent deformities. *One of the quickest and most effective means of producing flexion contractures and deformities of the knees is permitting prolonged use of pillows or folded towels under the knees.* Every effort should be made to use exercises and heat in such a way as to have the legs straight for a part of each day. *Rest and exercise are specifically prescribed in a proper balance or ratio for different stages: one can rest himself right into a deformity, also one can do too much or use the wrong kind of exercise.*

The principal function of orthopedic care is to add its techniques to the preservation of joint function and to restore such function if it has been impaired. This is accomplished with braces, plaster splints, rest splints used part time or during sleep, corsets, or specially designed shoes.

The orthopedic surgeon uses a variety of methods. He may teach specific postural exercise. These may be exercises in bed, sitting, or standing. Very gradual improvement in posture follows. Corsets nay be necessary, particularly in obese persons, to maintain better osture. The obvious ideal ultimate treatment here is weight re-
ction

Manipulation of a joint is occasionally carried out This should be done only by a person skilled in its execution Adhesions within or about a joint and contractures of muscles and fascia may be thus released or broken up It is usually not done during acute inflammation in the joint Muscular relaxation is essential for success. After manipulation a plaster cast is applied with the joint in the improved position Exercises and physiotherapy are begun promptly when soreness about the joint disappears This method is not popular today but certainly has occasional indication

There are a number of operations specifically useful in the treatment of rheumatoid arthritis Occasionally aspiration or removal of a quantity of synovial fluid is done. A joint may be surgically opened, and the inflamed synovium removed with improvement of function in that joint Shortened tendons may be lengthened by a specific orthopedic technique Occasionally cutting into the articular capsule will allow finger joints to flex and extend further Arthrodesis is an operation done to make a joint immobile If a joint is very painful it may be relieved of pain by being made perfectly stiff This is not ideal but occasionally is preferable to continual pain

Arthroplasty is an operation performed to make a new movable joint when it is ankylosed or fused and the articular surfaces are greatly distorted Satisfactory results have been obtained in ankylosis (fusion) of hips, elbows, and knees, but results have been less satisfactory in the fingers Some reconstructive operations have been done in which new joints are made These are not all predictable and are used only in special cases

ESSENTIAL GENERAL MEASURES

Rest

Over a period of years certain treatment methods in rheumatoid arthritis have stood the test of time and have been shown to have predictable value Rest is the most important of these Rest is *individually prescribed!* Rest is *a treatment!* One person may

require only one hour of rest during the day while another may require five or six hours of daytime rest with ten hours of night rest Complete rest in bed for weeks or months is occasionally necessary in order to gain control of a severe attack of rheumatoid arthritis This is best accomplished in a hospital or sanatorium

An individualized prescription is necessary rather than the nonspecific suggestion to "take it easy." Rest prescription is accompanied by an exercise and physical therapy program Some exercise is usually necessary no matter how intense the arthritis may be As with rest, exercise must be individually planned. The degree of rest and of exercise is balanced one against the other in such a way as to accelerate natural processes of healing and repair; overemphasis on rest is avoided in order to prevent muscle wasting, weakness, and to prevent deformity Overemphasis on exercises and joint use is avoided when the joint is acutely inflamed and the arthritis process is especially destructive. Permanent damage may be incurred by excess or ill-advised exercises Prescription of the proper balance requires keen judgment and considerable experience.

Light removable splints of plaster, aluminum, or plastic are used, especially to rest knees, hands, fingers, and wrists. They are worn intermittently at intervals during the day and at night Important dexterity of wrists and fingers is preserved It is not true that splints increase deformity—if properly used. Most patients try to keep joints active and moving to prevent deformity and loss of function Actually at certain stages in the disease excess use and overactivity keep the joints in a state of sustained and continued inflammation, accelerating joint disability

Wearing a splint does not increase the chance of a joint becoming permanently stiffened; in fact, it does just the reverse. A sure way of making a joint permanently rigid and deformed is to keep it continually inflamed by overusing it. The best way to prevent this is to decrease the inflammation as early as possible, one major contribution to this end is rest and immobilization in a splint

Rest in a splint is accompanied by decrease in inflammation

and pain, increase in mobility and function. A joint as large as the knee can be successfully treated with the splint method Splinting balanced by appropriate exercise, heat, massage, and total body rest is an extremely valuable technique. It is a temporary measure most useful in acutely and severely inflamed joints

To most patients a simultaneous application of rest and exercise in a treatment program seems contradictory, but rest means temporary nonweight bearing or nonuse of a joint, keeping it in an optimum position for function It does not mean prolonged immobility When properly executed, rest in bed can gain and maintain joint motion and muscle strength When both joint range of motion and muscle strength are gained and maintained, the patient can convalesce more rapidly, moving from an extensive rest program to more and more weight bearing activity

Proper rest may entail a change to a hospital or sanatorium environment. This is not necessary in the majority of instances Several weeks or months of rest in bed at home may be necessary in very active, fast-developing rheumatoid arthritis Rest is always interspersed with periods of activity The patient must be up and about to some degree even though it requires help

A change in occupation may be needed in order that daily rest periods can be instituted Elimination of fatigue does a great deal to restore mental and physical endurance of patients with rheumatoid arthritis

A prescription of rest in bed does not mean that the patient remains motionless Rest is taken in various positions depending on the special problem It is always interspersed with treatment by heat lamps, hot tubs, massage, exercise and medicines Rest is taken in various degrees A proper amount of rest in bed during very active stages of rheumatoid arthritis pays large dividends. During this period muscle wasting, tendon contractures, and joint swelling are prevented by physical therapy consistent with the patient's tolerance for it



Figure 8A Lucite splints for hand, wrist, and forearm

A general rule except in especially hot and swollen joints is that each joint is moved through as full a range of motion as possible, several times a day, preventing development of joint adhesions This is necessarily somewhat painful. In severely ill patients exercises may have to be done only with the assistance of another

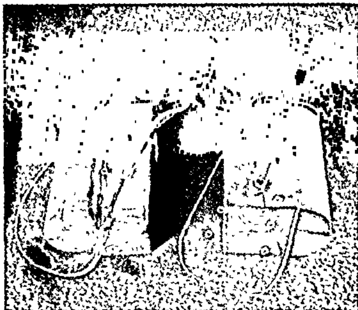


Figure 8B Wrist and hand splints, wood sanding blocks for hand exercises, which are combined with occupational therapy.

person who holds the extremity being moved and supplies some of the effort needed to move it

Properly administered massage of muscles between joints and active and passive movement maintain muscle tone preventing muscle wasting and shortening If the joint contracts because of muscle and tendon shortening it should be splinted for limited periods during the day or night to prevent loss of function The doctor prescribes methods of splinting and positions to be used

In the average mild or early case of rheumatoid arthritis rest is prescribed 10 to 12 hours out of each 24 Periods of rest are inter-

spersed with moderate activity. People who can be active with arthritis should be encouraged to work if such work is not a tiring or injurious type of employment. When the disease is very active and fatigue and pain are great, rest may be necessary from 14 to 20 hours daily.

One should rest with the joints in a functional position with good maintenance of body mechanics Exercises consist of movement of all joints in a maximum range. They are best carried out following rest and use of heat. *Exercises should not be extensive enough to produce pain persisting for periods of over an hour* Exercises should never be so strenuous as to severely tire the patient

When the diagnosis of rheumatoid arthritis is very probable, the ideal immediate course is to have the patient hospitalized not only for diagnostic purposes but more especially for the learning of methods and principles of treatment including rest, exercise, massage, and use of heat and the obtaining of plaster splints or traction apparatus that may be needed Duration of bed rest and the amount of it are decided upon, depending upon the patient's improvement and the stage of the disease.

When there are weight loss, hot painful joints, fever, considerable feeling of illness, loss of appetite, and other constitutional symptoms, complete bed rest is mandatory. Rest is decreased progressively with improvement With subsidence of pain and temperature and with improvement in general health, periods of being up and about are increased In some people a period of one to two weeks, mostly in bed, may allow them to get along for four to six months having only rest periods during the day In rarer patients four to six months may be required in bed with continued treatment This can be effectively and successfully carried out at home.

Preparation of the Bed

Most beds are too soft When lying on a soft bed the spine follows the curves of the mattress. The patient wakes unrested,

frequently with backache A bedboard of 1 inch plywood running the full length and width of the bed placed between mattress and springs gives proper support and maintains the spine in a more normal position. The bedboard prevents flexion or bending of hip joints while lying on the back Such a bed is often uncomfortable for the first few nights Most people find later that they are in much less pain and more rested Rest then repairs fatigue—rather than increasing it.

Height of the Bed

It is far easier to get in and out of bed if the whole bed is raised on 6 inch blocks under the casters Most beds are too low for patients with arthritis. To get in and out of a low bed forces one to stoop, strain, and bend, using many joints in an awkward way

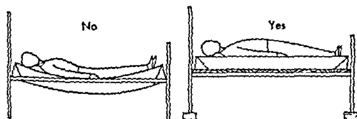


Figure 9 Preparation of the bed note use of (1) 1-inch plywood bedboard to prevent flexion or bending of the hip joints while lying on the back, and (2) 6-inch blocks under casters to elevate the bed which permits the patient to get in and out of bed with minimal joint strain

This is not done with ease by the arthritic The 6-inch elevation permits getting in and out of bed with minimal joint strain The bed elevation is of distinct advantage in moving readily from bed to chair Alternating chair and bed rest is a great relief from the monotony of bed rest Chair rest is increasingly urged as improvement occurs

Chairs and Chair Rest

Some notes about use of chairs are helpful Chairs should be raised 4 inches or more for maximum comfort. The patient's toes and forward ball of the foot should just touch the floor, heels slightly off the floor Legs are not bent as much at the hips while sitting in an elevated chair. The seat should be flat, and the back broad, high, and uncurved. Height of the arms of the chair is

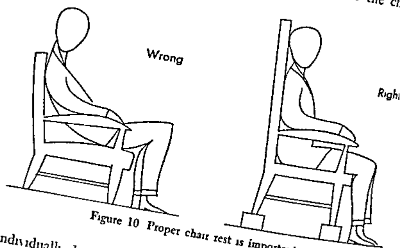


Figure 10 Proper chair rest is important.

individually determined, depending on the length of the patient's back and arms and whether he has arthritis in shoulders and elbows

Chair sitting for more than an hour commonly results in stiffness and fatigue When arthritis is most severe it is best to sit up in a chair three or four times a day for short intervals This is preferable to fewer times for longer periods. Whenever necessary, the patient should be helped out of a chair rather than struggle to raise himself Such activities put unnecessary strain on legs and arms. Help is best given by another person placing his arms under

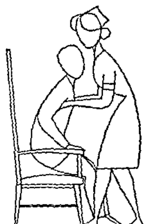


Figure 11. Assisting the patient with arthritis so that he does not struggle to raise himself from a chair

the patient's arms (facing the patient) and pulling back, letting his legs rather than his back take the weight

Care of the Patient in Bed

The patient must avoid lying in a flexed or bent posture in bed A firm mattress and nonsagging springs are required General body rest is more important in rheumatoid arthritis than in most other diseases In order to avoid contractures, positions of rest must be learned for the arms and legs *Joints should not be bent and contracted The best position is generally with the joints straight*

If the patient must spend considerable time resting in bed while the inflammation subsides, deformity may occur due to the way he lies in bed This insidious occurrence is clearly prevented by careful supervision of bed positioning Most people prefer to curl up in varying degree when resting or sleeping Arthritics too find they are more comfortable lying on one side with knees and hips flexed, but this ultimately leads to joint contractures, loss of muscle strength, and further pain and disability

The best rest position is on the back with joints straight, fingers,

wrists, elbows, and knees comfortably straight. At first this is difficult, but with persistence and practice it is soon evident that such rest is more effective, aching diminishes, swelling subsides, and relaxation is enhanced. To have joints straight does not mean to have them stiff.

There are very special ways for the person with arthritis to rest. Bedclothes should not be pulled tight. A pillow should be placed

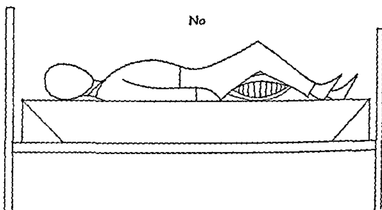


Figure 12. To avoid contractures, pillows should *not* be placed under the patient's knees The best rest position is on the back with the joints comfortably *straight*.

under the covers at the foot of the bed to keep them off the feet A simple wooden cradle is placed over the legs, keeping bedclothes off affected joints A bed bath daily and application of heat and massage in bed are necessary A member of the family can be trained to carry out these procedures very satisfactorily

Patients with rheumatoid arthritis usually have morning stiffness lasting from one-half hour to many hours or throughout the day. If a long night's rest produces too much stiffness it may be broken intentionally by short limbering up periods of activity and use of a heat lamp during the night. If the patient is very fatigued in spite of the program he may require more time in bed and less exercise.

When fatigue is due to worry or mental unrest, additional bed rest does not help. The psychological aspects of rest are important. Fear, apprehension, depression, all tend to accelerate the course of arthritis. Attitudes of hope, courage, determination, and the preservation of one's sense of humor—ability to see the lighter and brighter side to one's problems of pain and disability—augment the probability of recovery. Some people with relatively mild arthritis are disabled and crippled because of exaggerated fear of the disease—rather than by rheumatoid arthritis itself. The way the patient reacts to the arthritis is of real importance in determining the course the disease takes, in whether there is a mild, relatively unimportant arthritis problem, or a more severe disabling form of the illness. With proper understanding and a sincere belief in the efficacy of treatment, the inevitable emotional impact of arthritis is no great problem.

Special Joint Care in Bed

Rest of inflamed and painful joints is an important part of the treatment. When joints are especially swollen they should be immobilized by splints. These are made of plaster of Paris, Castex, or lucite (see Fig. 8A). They are molded in a proper form and are easily removable. The joint is placed in a position of normal rest, opposite to that of deformity. Splints are removed several times each day, and the joints moved through a full range of motion, short of severe pain. This will vary with tolerance. Splints are reapplied following such motion. The purpose here is to provide sufficient motion, preventing joints from becoming stiff and fused, and sufficient rest to permit healing. Splints are used for limited periods and are discarded as soon as a severe inflammation or threat of deformity has subsided.

Why do some patients with rheumatoid arthritis become bedridden? Why do deformity, joint fusion, and loss of function occur? The answer: First, knees become painful and swollen, muscles waste, the patient walks less and less and sits in a chair more and

more, finally he can't straighten his knees and hence can't walk and is confined to bed or wheelchair. Arms are folded; wrists and fingers are flexed, they become fixed this way, hands become powerless *All this is tragically unnecessary!*

The patient finally takes to his bed for one reason—his knees are in a flexion deformity Painful feet and ankles are bothersome but

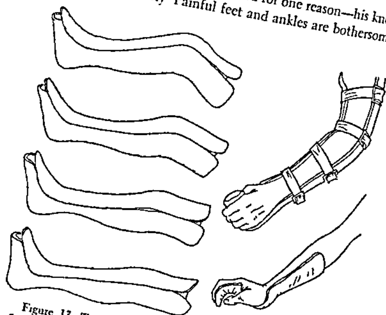


Figure 13. Types of splints used to rest joints that are inflamed and painful (*Left, top to bottom*) As deformity responds to treatment, a new cast is made in order to maintain progressive straightening of the involved knee joint (*Right*) Splints which support entire arm and forearm in order to rest inflamed and painful joints

don't confine one to bed When a patient has been in bed for years, has severe deformity and fused knee joints, these simple facts are forgotten As long as he walks, dresses himself daily, and uses exercise, physical therapy, and prescribed rest, he can keep muscles active and joints mobile To stop walking and sit only is to invite permanent deformity, living a bed and chair existence is to sit or lie



Figure 14 Plaster-of-Paris splint for knee and ankle, it has been bivalved to permit removal intermittently As flexion deformity becomes less pronounced, a new splint is made to maintain progress and motion

with knees and elbows flexed forearms bent in wrists and fingers flexed. Muscles waste, bones lose calcium and joint capsules scar heavily Excessively prolonged uninterrupted rest in bed is disastrous to muscles, bones, and joints *Feet must bear weight to keep their shape, cartilage needs to bear weight to preserve its vitality!*

Position of a joint is determined by a balance of muscular pulls and external forces Weak joints need strong muscles to support them When the force of gravity is removed, the joints of the arthritic quickly occupy a new and very undesirable position

Most pain of rheumatoid arthritis is felt in hands, wrists, and knees These are the most important areas to treat. We are apt to fear most two consequences. These are inability to walk and inability to use the hands. The patient can rest assured that he can always walk so long as he can straighten his knees, and he can always use his hands so long as he prevents them from drooping and facing the palms downward

This discussion is to point up and emphasize the importance of enthusiastic and extensive care of hands, wrists, and knees with splints, rest, and physical therapy. Only a few-weeks' inattention may lead to serious disability.

To rest a joint effectively it is generally kept comfortably straight The patient must remember that lying in bed with fingers, wrists, elbows and knees overly flexed, though comfortable, leads insidiously and subtly to further disability and deformity. Ideally elbows are slightly bent, wrists cocked up, fingers and thumbs flexed to approximate Use of these optimum resting positions becomes tiring after awhile, and it is necessary to move to another bed position The ideal resting position should be maintained as long as possible. The patient soon finds he can change to a slightly different position without discomfort

Small sandbags or folded towels along the upper arm and at the wrist keep elbow and wrist in slightly bent position while lying on the back Hands are best turned with palms upward A folded towel *under the ankle* helps straighten the knee while lying on the back Pillows are *never* placed under knees in any case, a small pillow may sometimes be used under the head. Patients with arthritis of the spine rest on the back with a small pillow or folded towel between the shoulder blades but not under the head.

Footboards and sandbags are very useful Feet generally tend to turn out when one is lying on his back. This strains the knee joints

Sandbags placed against the outside of the feet remove such strain Weight of bedcovers also tends to turn feet outward A footboard 8 to 12 inches high, placed on the edge across the foot of the bed under the covers, will keep bedclothes off the feet (see also Fig 37)

If the joints of the legs have been involved and splints have been used, weight bearing is begun gradually. Sometimes the use of a

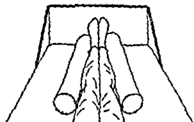


Figure 15 A footboard 8 to 12 inches high keeps the bed clothes off the feet when placed across the foot of the bed. More important, it supports the feet and ankles in a position of optimum function

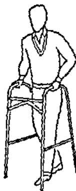


Figure 16 By using a walker, the patient can gradually increase the weight which the weight bearing joints must support

walker is necessary Weight bearing is gradually increased until the patient can walk with support of crutches, and then on to independent walking.

Pain, Fatigue, and Work

Avoidance of pain is extremely important! Pain itself drains strength and energy, whether from an aching back, a toothache, or

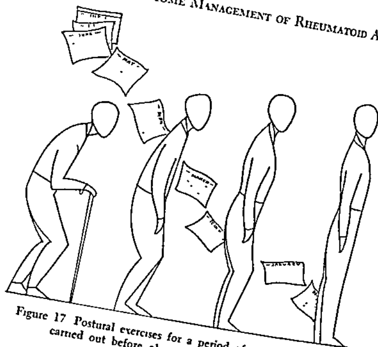


Figure 17 Postural exercises for a period of months must be carried out before obvious improvement occurs.

a few days or weeks as the patient does them. This makes performance easier and more effective. Daily inspection of oneself in a full-length mirror is very encouraging—as well as being a means of actually seeing progress. It is well worth the cost of the mirror Good posture develops slowly—the patient is often unaware of it until he has made considerable progress.

Postural Exercises

An important word of caution in regard to exercises All exercises must be individually prescribed The patient should not by any means try to do all the exercises. Rather those exercises that have importance in his particular case are *prescribed by the physician, clinic, or therapist.* The number and frequency of the exercises to be performed vary from none at all to actually doing most of those listed below There are types of arthritis and stages of this dis-

case in which exercise may be injurious, just as there are other types and stages of the disease in which exercises are essential to progress

Every exercise period should be started and ended with a breathing exercise in the following manner Chin in, breathe deeply, raising chest, hold chest up and exhale, relax, repeat three times or more

1 Lying on back—legs straight Tighten buttock muscles, retract or pull in abdominal muscles, flattening the abdomen Do not hold the breath An effort is made to get the lower back flat against the bed, straightening out the curve of the lower back This exercise may also be done lying face down, with a pillow placed under the abdomen It represents the starting point from which the following basic postural exercises are built

2 Lying on back—hands clasped in back of neck, if possible, repeat exercise No 1 Hold position and slowly bend one knee sliding one foot back, and then the other Hold back flat and slowly slide feet out until legs are extended

3 Lying on back—arms crossed on chest Tighten buttock muscles, retract abdomen Raise head and shoulders 6 to 8 inches from bed

4 Lying on back—hands at sides Tighten buttock muscles, retract abdomen Raise arms over head and inhale Keep back flat Lower arms and exhale

5 Lying on back—arms at sides Tighten buttock muscles, retract abdomen Roll arms outward turning palms upward and forcing shoulders back Keep lower back against bed Try to press back of neck against bed, keeping chin in

6 Lying on back—hands in back of neck, if possible Tighten buttock muscles, retract abdomen Alternate straight leg raising and lowering Do slowly

7 Standing back against wall heels 3 inches from wall, feet 3 inches apart Hands in back of neck Bend knees, tighten buttock muscles, and retract abdomen Hold back flat against wall and straighten knees

8 Lying face down—pillow under abdomen—arms shoulders

high and elbows bent to a right angle. Tighten buttock muscles, retract abdomen, raise arms and hands from bed bringing shoulder blades together.

PHYSICAL THERAPY IN RHEUMATOID ARTHRITIS

(See also Chapter 8 for Specific Directions)

Physical therapy implies treatment with heat (such as infrared and ultraviolet lamps, hot packs, heated paraffin, warm tub baths), exercises, traction apparatus, splinting, various appliances, micro-therm, diathermy, whirlpool, and ultrasonic therapy. Such physical treatment is an important aspect of the comprehensive program of treatment A broadly planned program is necessary rather than a trial of one or another type of heat, massage, tubs, or exercises. Physical therapy does not cure arthritis and is not utilized to the exclusion of other treatment. However, it is a potent, predictable means of avoiding deformities and inhibiting and preventing muscle wasting, which are common in arthritis Physical therapy in the majority of cases is a neglected, yet very useful method of treatment for rheumatoid arthritis This therapy is prescribed under the direction of a physician

Cooperation and teaching offered by a well-trained physical therapist are necessary In some communities this may be available by having the therapist come to the home. Elsewhere the patient may need to go to a hospital or physical therapy unit. The therapist may administer special treatment herself or instruct members of the family in proper use of rest, massage, exercises, hot tub baths, and infrared lamp *Regular daily care done at home is more valuable than occasional treatment at a hospital or doctor's office*

Heat has greatest usefulness in the subacute or chronic stage and should be applied daily to affected joints and less frequently to nonaffected joints This is followed by carefully applied massage of muscles between the joints with lighter stroking of the joints

themselves If arthritis is generalized, seeming to involve most joints, the hot tub bath or underwater exercises in a bathtub or a "Hubbard tank" (see Fig 29) are very effective (See Chap 8) Most people with arthritis derive relief from local use of heat. In arthritics whose symptoms are aggravated by heat the intensity and duration of applications should be decreased—but not stopped altogether This is a common mistake in home care

It is established that underwater exercise is effective in stimulating flabby muscles and making them work satisfactorily again The two essential *features necessary are that the water is buoyant and hot. The water is just as hot and just as buoyant in one's home town and in his own bathtub as it is in the most expensive and extensive spa in the world* Body weight is almost completely neutralized when floating in water This permits weakened muscles and joints to perform work and underwater exercises which are impossible out of water One need not go to a spa to obtain this useful and effective treatment

In a very acute, severe case of rheumatoid arthritis or for the very sick patient who becomes intensely fatigued, hot tub baths are not indicated Infrared lamps are very useful but can be over done Mild infrared radiation often relieves the pain in acute arthritis It may be given for 15 to 30 minutes several times a day Maximum heat tolerated comfortably, is focused on the painful joint The infrared lamp should be placed from 2 to 3 feet from the patient depending upon the type of reflector and sensitivity of the parts to be treated Careful avoidance of a skin burn is important A towel may be placed over the area that is being treated The towel does not interfere with penetration and helps to prevent a skin burn Infrared rays penetrate into the tissues about ½ inch

Warm paraffin applications are especially effective in arthritis of hands wrists ankles, and feet, the more acutely involved, the less useful is the paraffin application (See Fig 27)

Diathermy in rheumatoid arthritis has been overemphasized and in general is not useful It may help in very chronic advanced stages

of the disease Most patients with even moderate arthritic activity do not benefit.

It is often emphasized that heat in any form and in any degree is useful This is not true. The patient with a very acute, severe flareup obtains more relief from warm or hot moist packs over the affected joint for 20 or 30 minutes three or four times a day than from use of more vigorous therapy. Hot packs are applied by using turkish towels or old blankets cut into sections 1½ to 2 feet square. These are soaked in hot water and wrung out well A piece of plastic cloth or part of an old raincoat is put on the bed under the patient to avoid getting the bed wet The hot wet pieces of blankets or towels are then wrapped about the joint, extending well above and below the joint. Several layers of the hot packs are applied Next the towels or blankets are wrapped with another piece of plastic or rubber sheet This holds the heat in, and the packs may be left on for about 30 minutes. Some therapists prefer to simply apply the hot packs, leave them a few minutes, then remove them, and replace them with progressively hotter packs each four to five minutes for 30 minutes This is more time consuming but effective

One may alternate hot wet packs with electric heating pads, hot-water bottles, homemade bakers, infrared lamps, or other sources of heat The form of heat which the patient finds most relieving should be continued although several types may be used intermittently This may take some experimentation on the part of both doctor and patient

Light massage and increased exercises in bed are begun as the patient improves Too much motion may cause further joint irritation, thus prolonging the difficulty. On the other hand, too little motion encourages formation of deformities and leads to muscle weakness Good judgment is required. Sometimes it is impossible to exercise joints adequately because of severe pain. In hospitals, tiny electrical currents are sometimes used to produce

painless contractions of muscle reproducing the effects of active exercise and preventing muscle wasting.

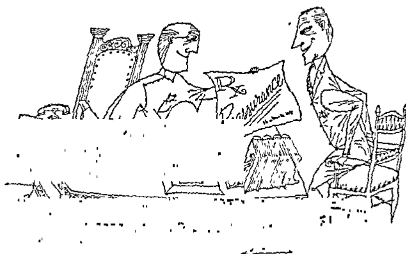
In chronic arthritis exposure to ultraviolet light is useful. This simply means being out in the sun. It improves the appetite and gives a feeling of well being. Too much exposure, however, may produce increased activity of the joint trouble. Certainly it is unproved that sunlight has any specific favorable effect upon the course of rheumatoid arthritis.

Often enough it is advisable for patients with chronic rheumatoid arthritis to plan to spend several weeks in a well-equipped physical therapy department, hospital or sanatorium for more intensive instruction and treatment, general checkup, and the benefits of a vacation. There is no effectiveness or virtue in any particular mineral waters. There is no proof that appreciable amounts of any element are absorbed from waters or muds. The value of spa or hospital therapy is that of rest, vacation away from home, and the value obtained from training in methods of rest, heat, exercise, massage, and warm water.

An important aspect of physical therapy is that it be done on a regularly planned program. It takes precedence over other activities or events in the day. Since the patient cannot earn income if he becomes disabled from arthritis, the treatment has higher priority than work. It may be necessary in some cases for patients to modify their job or hours at work to provide additional rest periods and time for proper treatment.

For the unemployed patient an important part of management is to secure employment. This may be work at home, a job in which he works only a few hours a day, or it may be work brought to him from outside. It is always important for his mind to be occupied and interested in order that he is not constantly thinking about his arthritis. Work should be interesting and absorbing for the patient. Jobs can be designed to encourage use of weakened muscles and stiffened joints.

For specific techniques in home care see Chapter 8.



Chapter 7

HOME CARE OF DEGENERATIVE JOINT DISEASE (Osteoarthritis)

The most important issue before treating this condition is to be sure that it is degenerative joint disease and not one of the others. This is a chronic disease, there is no cure for it in the sense that it can be eliminated completely. However, intelligent care achieves excellent results. Treatment of each person with degenerative joint disease is significantly individualized under a physician's care.

Degenerative joint disease is annoying but not a serious condition. It does have a lot of nuisance value. Treatment is very effective but must be carried out on a comprehensive and long-term basis. This is not a "crippling arthritis." Although one is told that he has

arthritis," this is a misnomer here, joints are not inflamed or destroyed. Crippling is rare. Except in cases with extensive hip involvement, no real deformity occurs in degenerative joint disease. Nevertheless, this disorder is chronic and cannot be cured.

Degenerative joint disease is a disease of cartilage, it is largely a disorder of wear and tear, and worn or damaged cartilage heals and regenerates very poorly if at all. Damaged cartilage cannot be replaced or repaired. Since degenerative joint disease is a chronic incurable disease, treatment should be started as soon as the disorder is recognized. Its progressive course may be arrested and possibly partially reversed. A special form of osteoarthritis, common in middle aged women, may be quite annoying and painful for several months or years. Multiple joints are involved, some of which may be quite painful, warm and swollen. The most troublesome joints are the end joints of the fingers, the next row of finger joints to them, and the joints at the bases of the thumbs near the wrists. Joints of the spine as well as most other joints may be involved. Although confusion with rheumatoid arthritis exists, the ferentiation is easily made. Generalized osteoarthritis runs its urse and gradually subsides in months or years. Joints may be ome enlarged, hard, and knobby but they are finally painless and ork well.

The first treatment is a large dose of "Hour of Reassurance." Many people with this problem think 'arthritis' is a single disease and, having seen people crippled with rheumatoid arthritis, picture themselves in the same invalid state. The disease slows the patient down a little but should never stop him.

In home management of degenerative joint disease as in rheumatoid arthritis a complete and comprehensive program is all that is of value. Specific drugs have no place here. The comprehensive home care program is time tested and effective. In the aggregate all the measures used arrest the disease, relieve pain, and allow maximum repair to proceed. Treatment is so simple and prosaic that often enough people do not accept it: they look fo

fancier, more expensive, and more complicated therapies which are really ineffective. The patient can easily be misled by false information about "cortisone treatment, prednisone, or the new super-aspirins" in degenerative joint disease. They have no place except under unusual circumstances.

REST

Degenerative joint disease (osteoarthritis) is a disorder mainly consequent to wear and tear of cartilages, thus rest is primarily important. Amount and types of rest vary, depending on the joints involved and the severity of symptoms Patients rarely require complete bed rest. When weight-bearing joints such as knees, hips, lumbar spine, or ankles are involved, rest lying down in bed or on a couch is needed, *one hour each morning and each afternoon* The bed surface should be firm. Some patients find that elevating the foot of the bed 3 or 4 inches in height with blocks under the casters provides more effective rest. This seems especially so in hip joint involvement

Working hours may have to be changed in order to obtain daytime rest periods Patients can do more and better work with less joint damage by dividing the day with rest periods rather than by trying to work straight through and then rest. Rest lying down is advised for 30 minutes or so after the evening meal When nonweight-bearing joints, such as fingers and wrists are involved, one must avoid prolonged use of these joints at any one time.

Rheumatoid arthritis is often confused with degenerative joint disease Patients become alarmed in fear that joints will become stiff unless they are exercised continuously. This is not at all true Excessive exercise to the joints results in additional injury, wear, tear, and damage to the joints. Each joint should be moved through a full range of motion several times a day, this is enough It is best to err on the easy side, to do a little too little rather than a little too

much By all means, one should keep going but with frequent rest periods

OBESITY

Excess body weight (fat) is a major cause of degenerative joint disease Treatment of obesity by diet and weight reduction is essential This cannot be overemphasized Joint pain, stiffness, and discomfort in the obese patient results from the mechanical strain imposed by the excessive weight to be carried Many patients can really be 'cured' (have no symptoms at all) by simply losing 25 to 50 pounds of excess fat This is usually true even though there is definite organic damage to the joint structures Such joints have sufficient functional capacity remaining to carry out a moderate amount of work without symptoms but are unable to endure the overstrain imposed by obesity

Proper long-term management of obesity requires a great deal of effort and understanding on the part of the patient He should know the nature and causes of obesity and the principles of what constitutes proper eating Essentially the obese person eats more fuel than he burns, and the excess is stored under his skin as fat The principle of treatment is to eat less food than one burns and thus utilize the stored fuel for energy, ultimately losing the excess and attaining a satisfactory weight A 1000 calorie diet is an average reducing diet

A correction of the attitude toward hunger is the first point to be made Most well persons in the middle decades with a normal zest for the pleasant things in life must choose between being obese or hungry Hunger really is a memory of the fun of eating for the majority of us It is a natural wholesome state rather than a symptom to be treated at its earliest appearance by an excessive food intake Eating should be interrupted far short of satiation

Many obese patients honestly do not believe they are large eater and hope and long for some obscure 'gland trouble' as the caus

Rarely, if ever, is this the case, and if it is, the basic fact remains that food is being taken in excess of its consumption and storage occurs as fat

Treatment of obesity is lifelong, and the patient should plan to maintain his weight reduction once it is achieved He cannot resume careless eating, if he overeats he will become obese again Control is relatively easy after a long period of self-discipline. The increased feeling of well-being and relief of joint pain and stiffness are a great incentive to maintaining proper weight. A weight reduction program should be planned with the doctor's advice and guidance.

BODY MECHANICS

Poor body mechanics such as poor posture, weak, flat feet, and spine curvature place extra strain on the knees and low back Correction of faulty posture by postural exercises and various supports are useful The postural exercises described in Chapter 6 are very satisfactory here. Consultation with an orthopedic surgeon for prescription and fitting of supports may be needed Simple orthopedic exercises and use of appliances make a great difference in joint function and freedom from pain. A short leg, bowlegs, or knock-knees can often be corrected to decrease strain on degenerated joints

GENERAL MEASURES AND EXERCISES

Protection of actively painful joints is obtained by proper use of splints, braces, canes, crutches, and traction apparatus. Physical therapy is important. Heat, especially wet heat, such as packs or hot baths is beneficial. Massage often affords relief. Graded active exercises are taught to correct poor body mechanics and overcome weakness of important muscles. See Chapter 8 for physical therapy methods

Modern life tends toward degenerative joint disease in that many activities are done in a poor postural position and for a long period of time Long train and plane rides are frequent, automobile trips that may entail many hours of sitting are an everyday experience, double feature movies and double header ball games entail long sitting periods The patient is well advised to get up *frequently and walk about, or stop his car, to stretch and walk every* one to three hours or move his legs and trunk while sitting in the theater. Such activity helps prevent much stiffness

Television has had an adverse effect on degenerative joint disease in two ways The patient often sits for long periods without moving Poor sitting posture for long periods aggravates the disease in the spine Secondly, some television viewers eat large quantities of high-caloric snack foods, augmenting their obesity Thus, moderation in television viewing is important

Exercises must be prescribed, they are not to be done at random The exercises *to follow should be selected by the physician for the* particular needs of the patient It is emphasized that all the exercises are not done In any individual case only a few exercises may be indicated Often the prescription calls for postural exercises and a few others for spine, hip, or knee as may be indicated The exercise program in some instances may constitute a major aspect of treatment, requiring much time and effort, in other cases the exercises may be directed only at one joint *Individualization of exercise treatment is the keynote*

The following exercises with appropriate instruction are used in degenerative joint disease The joints involved are exercised, and each exercise when prescribed, is done three to five times It is not like a daily dozen, but rather the joint is carried through the exercise slowly and deliberately If pain persists for more than 30 to 60 minutes, the exercise has been excessive and should be reduced—but not stopped Exercises are most effective when done after the use of heat

Spine—Subacute Stage *Spine exercises bring into motion the*

many small joints of the spine which may receive little exercise. The joints are moved, vertebrae are made to move, circulation to the small joints is improved, muscle power is increased, and muscle wasting prevented.

1 Lying down, knees bent, hands on top of head, chin in, no pillows Breathe in, raising chest Keep chest high and exhale a little air, flattening upper part of abdomen in region of diaphragm.

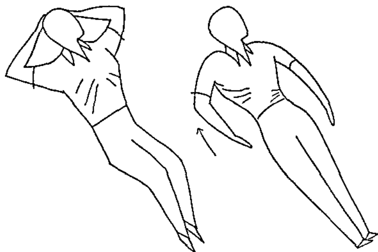


Figure 18. Exercises for the spine, subacute stage. (*left*) step 1, (*right*) step 4.

2 Same position Pull lower abdomen inward and upward to flatten it. Relax Repeat

3. Same position Pull lower abdomen inward and upward and tighten buttock muscles, to flatten lumbar spine. Relax. Repeat.

4 Legs flat, back flat Stretch ribs upward and outward on one side by bending the spine to opposite side as you breathe in (rib-vertebra joint exercise) Relax Same on other side. Alternate sides

5 Legs flat, arms at sides, outwardly rotated at shoulders, palms up Flex upper part of spine by pulling chin down Relax Repeat

6 Prone lying position with a large pillow lengthwise under the abdomen, hands clasped in back over buttocks, chin in Rotate both arms outward, spreading shoulder blades Relax Repeat.

Spine—Chronic Stage 1 Sitting erect in straight chair, hands on top of head, elbows back, chin down, low abdomen flat Breathe in, raising chest Keep chest high and exhale a little air, flattening upper abdomen in region of diaphragm Ten times

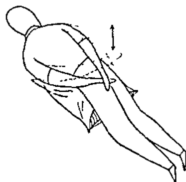


Figure 19 Exercise for the spine, subacute stage, step 6

2. Same position, but arms at sides Stretch ribs upward and outward on one side by bending the spine to opposite side as you breathe in Relax Same on other side Alternate sides ten times

3 Same position, but arms at sides Twist to alternate sides, in upper part of back, keeping low abdomen flat Ten times

4 Same position Bend to alternate sides, in upper part of back, keeping low abdomen flat Ten times

5. Standing, heels 4 inches from wall, buttocks, shoulder blades, and head touching wall, chin in, hands on hips Pull lower abdomen inward and upward and tighten buttock muscles to tilt pelvis downward in back Relax Repeat ten times

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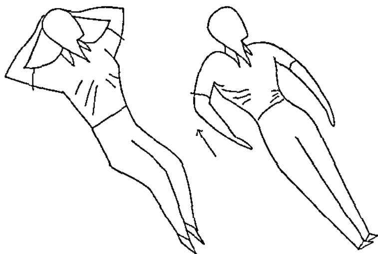


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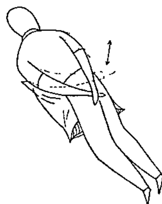


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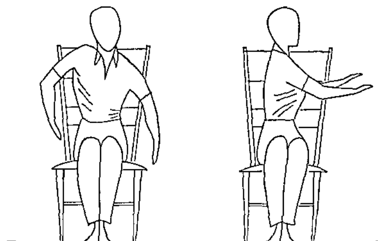


Figure 20 Exercises for the spine, chronic stage, (*left*) step 2, (*right*) step 3.

6 Back flat, as in previous exercise, against a door jamb, hands at back of neck Push both elbows back, inhaling Relax arms, exhaling Ten times Practice walking with feet comfortably straight, ahead, weight forward and on whichever foot is in front, abdomen and back flat, and ribs up and forward

CERVICAL SPINE *These exercises are designed to increase the range of motion of the neck, decrease muscle spasm, and improve muscle power* The small joints of the cervical spine are all brought into motion by these movements.

Subacute Stage 1 Lying down on flat surface, knees bent, hands on top of head Pull chin in to stretch back of neck Relax Repeat.

2 Same position With chin held in, bend neck from side to side

3 Same position With chin held in, rotate head from side to side

Chronic Stage 1 Prone lying position, pillow under abdomen, hands on mattress near head Lift head from bed, keeping chin in Relax Repeat

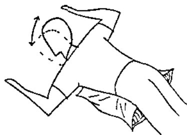


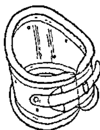
Figure 21 Exercise for the cervical spine, chronic stage, step 1

2 Same position Raise head, chin in, and turn head from side to side.

3 Standing, heels 4 inches from wall, buttocks, shoulder blades, and head touching wall, palms at sides, forward Pull chin in, stretching neck, without losing contact with wall Relax Repeat

4 At wall, same position Keep chin in and rotate head from side to side

The cervical spine can be supported by a rolled towel collar A Thomas collar is useful in treating joints of the neck Traction may



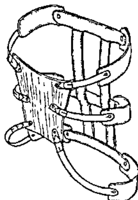


Figure 22 (*Left*) Cervical collar useful in treating joints of the neck (*Right*) A long, firm corset which is sometimes essential for treatment of the lumbar spine

dry Home methods where heat is applied several times a day are much preferred to infrequent office visits.

Swollen end joints of the fingers, Heberden's nodes, frequently painful, are helped by hot soaks or paraffin baths, as outlined in Chapter 8 on physical therapy Massage is helpful after heat treatment. Massage of muscles between the joints is useful, massage over the joints must be gentle. Moderate exercise reduces muscle spasm and wasting Exercises are repeated three or four times daily, beginning with small amounts each session and gradually increasing

DIET

There is no evidence that diet is effective in the treatment of this disorder except as it relates to obesity Obesity places undue strain on weight-bearing joints, weight reduction is attended by gratifying relief of symptoms

DRUG TREATMENT

The only drugs of definitive use in degenerative joint disease are the salicylates (aspirin, Bufferin, and sodium salicylate). These are helpful in controlling pain, much smaller doses are used than those recommended in rheumatoid arthritis Two tablets four times daily after meals and at bedtime are usually sufficient. Except for the salicylates and occasional sedatives, other drugs have no place.

Many drugs have been used, such as vitamin B_{12}, sulfa drugs, iodide, vitamin D, cortisone, and many others. A hormone called estrogen is advocated by some, deplored by others. This remains controversial, in the experience of some doctors it may relieve pain and numbness of the fingers but not the swelling It has no known or proven value in degenerative joint disease. Some doctors advocate estrogen when the end joints of the fingers are involved

X-ray therapy was used in this disease but is not currently approved Generally it was not helpful In degenerative joint disease

of the hip, injection of the hormone, hydrocortisone, is clearly useful in relieving pain as well as in increasing hip joint mobility. Its use entails practically no risk, and since hip joint disease can cause crippling, use of the hormone injections has an important place. The injection should be made only by a skilled physician in a hospital or well-equipped office. This treatment is also used in joints other than the hip, mainly the larger joints.

SPECIFIC JOINT INVOLVEMENT IN DEGENERATIVE JOINT DISEASE

END JOINTS OF THE FINGERS. End finger joint swelling sometimes causes considerable alarm because its appearance is cosmetically objectionable. These joints may or may not be red, tender, and painful. One can be assured that this is not a crippling arthritis. Rheumatoid arthritis does not involve the end joints of the fingers. It is good advice to accept their appearance and not waste further money on fruitless treatments.

When pain is present, physical therapy in the form of paraffin hand baths or hot soaks relieves it.

PARAFFIN TREATMENT. Three or 4 pounds of paraffin are melted in the top of an ordinary kitchen double boiler. Paraffin wax melts completely at 190° F. The paraffin is removed from the heat and allowed to cool to 120° F (as indicated by a thermometer). At this point there should be a thin film of solidified wax on the surface. The hands are dipped in the wax one at a time, then dipped in and out four or five times until both hands are covered with a thick coating of wax. The hands are then wrapped in oiled silk, oiled cloth, or thin plastic and covered with a light blanket. They are left wrapped for 20 to 30 minutes, the cover and the wax mittens are removed, and the wax is returned to the container for subsequent applications. This treatment should be carried out once or twice a day.

When outdoors in cold weather, warm gloves or mittens are

advisable Avoidance of injury reduces pain and retards swelling Exercises of fingers as outlined in Chapter 8 are also pain relieving Estrogen hormone therapy sometimes relieves pain and numbness These enlarged joints ultimately become painless regardless of treatment Most cause no pain at any time

NECK SPINE PAIN This section of the spine is benefited by long rest periods of lying on the back without a pillow. This is combined with physical therapy such as gentle massage, exercises, and heat—dry heat with an infrared lamp or wet heat with hot packs Trac-

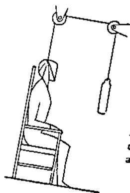


Figure 23 Traction on the cervical spine is accomplished by a sling fitting under the chin and back of the head, system of pulleys and weights is shown

tion, with gentle pulling by weights on the neck by the head, is usually helpful This overcomes muscle spasm and relieves pressure on nerves of the neck The traction apparatus consists of a sling placed about the head, a rope extends from the sling up over a pulley, a weight is attached and allowed to exert continual traction This is used in increasing time increments from 5 to 30 minutes The amount of weight is also gradually increased. An average adult requires 10 to 20 pounds of traction The head is rotated gently from side to side during the traction treatment.

Treatment of other parts of the spine entails physical therapy, rest, and correction or control of features that cause strain, such as obesity, curvature of the spine, or occupational strain.

DEGENERATIVE DISEASE OF HIP AND KNEE JOINTS The treatment of advanced hip joint disease is unsatisfactory Treatment is directed first at relieving strain on ligaments and muscles This is accomplished by rest in a recumbent position Splinting of the hip may be necessary Traction and postural exercises are helpful Treatment with physical therapy in all forms is useful

Surgical replacement of the hip joint by an artificial prosthesis is occasionally carried out successfully In general this is done only in advanced cases Newer operations currently being developed may change the whole picture of degenerative joint disease of the hip joint Without severe pain surgery is not indicated

Weak, painful feet may cause pain in the knees and hips Treatment includes care of the feet Free bits of cartilage or bone may cause both pain and a painless unpleasant grinding sensation in the knee These are called "joint mice," and they cause "locking" This leads to more rapid and extensive degenerative changes in the knee joint They should be removed surgically before such changes become excessive

ORTHOPEDIC TREATMENT Orthopedic surgeons offer much help for specific problems Such static abnormalities as flatfoot, a short leg, bowleg, or knock-kneed deformities, and spine curvatures can be corrected to decrease the strain on degenerated joints Protection of actively painful joints is secured by use of appropriate braces, splints, canes, crutches, or traction apparatus until irritation has subsided Special referral to an orthopedic doctor may be indicated

In summary, degenerative joint disease is treated as follows

1 Daily periods of rest of the involved joints
2 Avoidance of injury, strain, or unusual use of joints
3 Reduction in weight if overweight, particularly if joints of the lower extremities are involved
4 Adequate vitamin intake

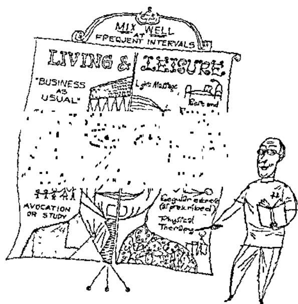
5. Physical therapy such as heat, massage, and exercise properly carried out.

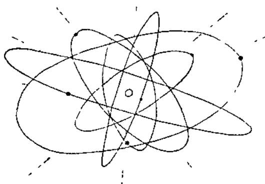
6. Normal body mechanics with elimination of faulty posture, provision of proper supports, and exercises for the feet.

7. Occasional use of supports to the back, hip, knees, or feet by corsets, elastic bandages, crutches, or splints.

8. Relief of pain by use of salicylates.

9. Occasionally operations are done on the hip joint; "joint mice" may be surgically removed.





Chapter 8

SPECIFIC INSTRUCTIONS FOR HOME APPLICATION OF PHYSICAL THERAPY

Physical forces constitute the basis of all life on earth. The warming rays of the sun, the movement and flow of hot and cold water, the electrical charges in things animate and inanimate, all about us form parts of nature's inexhaustible and powerful array of forces. The same physical forces, harnessed and properly directed, are of inestimable value in promoting healing. They increase circulation, augment local and general body metabolism, suppress nerve irritation, inhibit growth of germs, speed repair and healing of injured or diseased tissues, restore disturbed function, and relieve pain and improve health of the entire body. Although the evolution of

physical medicine has only gradually occurred, its tools are as old as matter itself

Physical therapy is simultaneously the newest and oldest field of medical practice. In pre-Paleolithic times, 7000 B C or earlier, primitive man basked in the sun receiving the benefit of its warmth and vitalizing effects. He began the practice of heliotherapy. The first man to bathe a wound in water learned of its benefits; whoever first rubbed a bruised muscle introduced massage. Electrotherapy began sometime from 14 to 37 A D, about the time Jesus of Nazareth was crucified The story is told of Anthero, a "free man" who on a walk at the seashore, stepped on a "torpedo," an "electric" fish, and was "freed of the gout"

From these early beginnings, the specialty of physical medicine has grown slowly, using in the treatment of disease heat, light, water, electricity, mechanical agents, and many other physical devices In ancient times, Greeks, Romans, and Egyptians practiced certain natural electrical therapy, hydrotherapy, massage, and exercises

The sun especially was used as a means of treatment and worship. The Greeks worshiped Helios, the god of light and healer of the blind At Heliopolis, they built a great medical school dedicated to him The Aryans of ancient India deified Savitar as a combination of sun god and divine physician The Philistines and Israelites worshiped Baal as god of sun and health. The religious cult of Mithra, a sun deity and god of healing, extended from its origin in Iran over Asia Minor, Greece, and the Roman Empire.

The Romans practiced "fever therapy" in their baths or "sweating houses" There were a series of rooms with baths of varying temperatures and for different purposes—the tepidarium, frigidarium, and anointing rooms Spartans made cold bathing obligatory by law The ancient Chinese utilized extensive gymnastic exercises and massage as did the Persians and Phoenicians

Throughout the Middle Ages, the Renaissance, and modern times physical medicine continued to grow to its present zenith

from which its future is one of ever more expansion, invention, and progress Thus, when the patient begins to use these methods, he can be assured that they have been well tried and have a long and venerable history behind them The wonder is that there frequently exists a significant problem in convincing people of the efficacy of the treatment methods which follow.

When physical therapy is properly used it is one of the most valuable and least expensive adjuncts in the comprehensive home program Physical therapy does not cure arthritis, its use to the exclusion of other methods of treatment does not produce good results It is less well understood and less frequently employed than any other form of therapy, albeit, very important Physical medicine in arthritis is an individualized form of treatment Its prescription requires an evaluation of the extent of joint involvement and an estimate of the intensity of activity of the disease *Thus, rest, physical therapy, and exercise are prescribed in a ratio consistent with the degree, duration, and location of the joint involvement and the degree of systemic symptoms and signs* Muscles and joints must receive careful individualized attention from the time the disease is first recognized or from the time the patient seeks treatment, whether this is at the onset of arthritis or any stage in its development The aim and purpose of physical therapy are to relieve pain, arrest muscle wasting, retain and regain normal joint mobility, prevent and reduce deformity—rehabilitate to the limits of possibility

Unfortunately physical therapy in the past was looked upon with distrust by many conservative physicians because of its exploitation by unscrupulous quacks and charlatans who made unwarranted claims regarding its efficacy "Electrical treatments" were what constituted physical therapy in the hands of these people Kin Hubbard said, "A man is generally 'down on' that which he is not 'up on'" There is no longer any justification for a skeptical attitude by a few uninformed medical and nonmedical people who condemn physical therapy because they have no knowledge of the

field. Physical medicine is clearly a part of the whole of medicine in the same sense that radiology, internal medicine, pediatrics, or surgery is.

Physical medicine employs physical properties of light, heat, cold, water, electricity, massage, manipulation, exercise, and mechanical devices for physical and occupational therapy in the diagnosis or treatment of disease The physical therapeutic measures used in the treatment of rheumatic diseases include heat, massage, hot and cold water, rest, exercise, and passive motion, rarely electrotherapy and x-ray therapy. Occupational therapy is an important means of treatment.

In order to be effective for the arthritic patient *physical therapy must be carried out as prescribed* in the home for an indefinite period No greater truism exists in arthritic care. The program is individualized for each patient. The physician gives several demonstrations of treatment This is often done in a hospital physical therapy department or by a trained instructor. Written instructions and class demonstrations are effective The patient who has had a sufficiently detailed outline of what he is to do and who continues treatments at home soon becomes enthusiastic about derived benefits

To have a good result the patient must accept and carry out treatment Patient and family must realize some of the psychological complexities A chronically disabled rheumatoid arthritic patient who has over many years gradually and progressively relinquished his self-sufficiency may find it difficult to become abruptly better Stopping the progress of what was a hopeless disease has psychological impacts The patient is suddenly aboutfaced and asked to accept new responsibilities that he may not have accepted for years These problems can be overcome, but the patient and his family must be aware of them

It is easy to establish goals for a patient, seemingly compatible with his physical and intellectual capacities, it is more difficult to set goals that will be psychologically acceptable to him and within

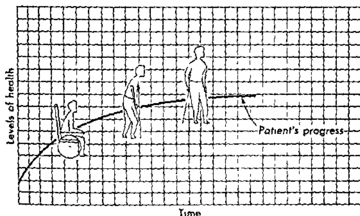


Figure 24 Treatment must be consistently carried out by the patient in order to achieve progress

the range of his motivation Thus, it is best to start a treatment program only with a thorough understanding of arthritis as a disease Treatment limitations are defined, reasonable goals are set, the patient has instilled the insight to appreciate what is to be accomplished. It is only done by hard work on his part False hopes for cure or reversal of damage already accrued can be dispelled from the outset, objectives are mutually appreciated between doctor, family and patient Patients who cannot be approached on such realistic grounds may fail in their rehabilitation program

APPLICATION OF HEAT. USES AND ABUSES

For one heat, all know, doth drive out another.
George Chapman

The application of heat in some form is the commonest treatment employed Heat is derived from several sources of energy—radiant, electric, and sonic

The term radiant energy is applied to rays with wave lengths in the electromagnetic spectrum between the "far" infrared energy band on the one hand and the "far" ultraviolet portion of the spectrum on the other Between these extremes lies the visible light spectrum, the source of luminous heat.

Visible and infrared rays, the sources of radiant heat, differ from rays derived from other parts of the spectrum in that their action is primarily thermal Their application is accompanied by a burning sensation They have no biological action, and their effectiveness is due entirely to heat production, contrary to sonic energy and x-ray.

Radiant energy is applied to the body by conduction or convection *When heat is applied by conduction the energy is transferred by direct contact from the warmer to the cooler subject.* This includes such homely methods as hot-water bottles, direct applications of heated bodies such as bricks, sandbags, irons, electric pads and blankets, hot compresses and hot packs Conductive heating includes more elaborate procedures fever cabinets, hot moist air, devices in which hot water flows through various applicators, and the very useful paraffin bath.

Hot baths and all hydrotherapeutic procedures that depend on thermal stimuli for effectiveness are methods of heating by conduction These are tub baths, whirlpool baths, tanks, pools, and contrast baths

In heating by convection the heat is transmitted through air or atmosphere to the body from an outside radiating source. This heat falls within the infrared portion of the spectrum The commonest application of heat by convection is with luminous lamps which utilize radiant energy produced by carbon or tungsten filament bulbs, reinforced by reflecting surfaces

An effective method of applying heat by convection is the use of bakers Bakers are luminous heaters composed of a number of light bulbs covered by a concave reflector. They are easy to handle,

readily constructed, and are made up in different sizes and shapes

The methods of heating, discussed above, are relatively slow. Unless application is unduly prolonged they cause no effective deep heating *To accomplish this and produce heat in deeper tissues one converts electromagnetic energy into heat produced by high-frequency alternating currents* The most widely employed method of conductive heating is diathermy There are three types of diathermy long wave or conventional diathermy, short wave diathermy, and microwave diathermy *Their value is due to thermal* reactions and not to specific biological effects

The method most frequently employed by physicians and in departments of physical medicine for production of deep heating is short-wave diathermy When short wave diathermy is applied the patient becomes either a part of a high-frequency condenser or a conduction field, depending upon the type of electrodes employed. Short-wave diathermy has attained popularity in the medical profession because it gives more rapid, deeper penetration of heat than long wave diathermy It is an easier, safer, and more convenient method of applying deep heat However, there is currently fairly general disapproval and disinterest by physicians for the use of diathermy in arthritis Its value is very much in question

The third form of diathermy more recently developed is microwave diathermy In this procedure the physical properties of electromagnetic energy produced in a radar system are utilized to bring about deep localized heating Microwave radiation causes a marked increase in blood flow *The disadvantage is that there is no method* by which dosage delivered can be accurately estimated Microwave is the only form of diathermy that is used much today

The most recent addition to thermal treatment is ultrasonic radiation, a means of producing heat in tissues by sound waves. Unlike electromagnetic vibrations, sound waves cannot pass through a vacuum Their propagation requires some material substance between the source of sound and the area treated Heat

generated by these rays penetrates to a depth of 2½ inches or more Treatment value of sound waves depends on heat production Most workers believe ultrasonic therapy is best employed with caution for the present until more is known of it.

EFFECTS OF HEAT. Changes produced by heat are complex. Heat in any form applied to the body causes an increased blood flow due to dilation of small blood vessels This results in a rise in capillary pressure, increased local chemical activity, and augmentation of defense mechanisms in that area

Maximal temperature rise occurs at the point of contact where energy exchange is greatest. After a sufficiently long period of local heat contact, deeper tissues show a significant temperature rise as a result of conduction. Excessive local temperatures are prevented by increased blood flow distributing heat throughout the body

Total body heating finally causes fever, as balance between intake of heat and its dissipation is disrupted.

INDICATIONS FOR THE USE OF HEAT Heat is a useful and important adjunct, combined with other major measures in the comprehensive program Local heat application relieves pain in arthritis Hot packs, tub baths, and radiant heat are widely used for general muscle relaxation and to relieve muscle spasm. Heat is often applied before massage, manipulation, or therapeutic exercises since it enhances their effectiveness

Baking, infrared rays, hot compresses, whirlpool baths, hot tubs, and paraffin packs locally are most widely used. Short-wave diathermy and microwave diathermy are of little value in treating the arthritic

For rheumatoid arthritis, mild elevation of general body temperature to 102° F for not over two hours has rarely been found to be a helpful adjunct

Light

> Let there be light, said God, and forthwith light ethereal, first of things, quintessence pure, sprung from the deep
>
> John Milton

Specific Instructions in Applying Dry Heat The simplest type of heat lamp is a cup shaped polished reflector with clamp or handle which can be attached to a chair back or bed The 250 watt Mazda CX bulb is connected with an ordinary electrical outlet The whole apparatus usually costs no more than $5 More elaborate commercially manufactured lamps may be obtained from medical supply dealers

The part to be treated is exposed 18 inches from the lamp The area is treated for periods of 20 to 30 minutes one to four times daily, depending on individual need The area where heat energy strikes the skin is small in this type of lamp, averaging 5 to 8 inches with a tungsten filament Consequently its use is restricted to single small areas "Hot spots" are present in such lamps where

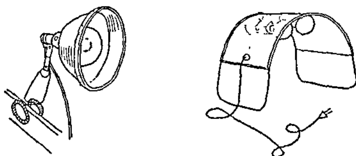


Figure 25 Equipment for the application of dry heat, (*left*) simplest type of heat lamp, (*right*) luminous baker

heat energy is more intense. Burns are more apt to occur than with lamps providing an even distribution of heat. However, a thin blanket or towel may be placed over the treated area, not interfering with penetration, permitting adequate therapeutic heat, but preventing skin burn.

Similar lamps attached to an adjustable stand or with a "goose neck" may provide more flexibility and permit perpendicular application to curved parts of the trunk Changes in the distance from the area being treated strikingly affect intensity of the heat.

LUMINOUS BAKERS The luminous baker contains several light bulbs Larger commercial types have 4 to 12 bulbs of carbon or tungsten filament They provide uniform heat, distributed evenly over all areas beneath the reflecting surface.

An inexpensive model for home use is easily made by a tinsmith A frame of light metal to which is riveted a reflector of polished steel sheeting is very effective Steel sheeting is placed on top of the frame in a slight arc.

Just below the tin sheeting are set two double electric outlets in which four 60 watt bulbs are placed The outlets are connected in multiple with a heavy lamp cord 6 feet long Dimensions of the baker for use over arms or legs are 17 inches long, 15 inches wide, and 14½ inches high

If the baker is to be used over the whole body, the upright supports should be 2 to 3 inches higher. Bulbs are lighted in sufficient number to produce the desired amount of heat. When this is obtained most of the bulbs are turned off and a small amount of heat maintains the desired temperature. Although slightly more expensive, bakers can be obtained or built which have thermostatic control, automatically maintaining proper temperature.

The apparatus may be made large enough to include the entire body except the head. The body baker is preferable to the hot wet body pack and is simpler to use. There is not as much initial heat as occurs with the wet pack.

Baking promotes muscular relaxation and increased blood flow

to the part (augmenting nourishment for injured tissues) and hastens removal of waste products by circulating blood Relief of pain and joint stiffness is a consequence

Care is taken not to have bulbs or hot metal in contact with skin Heat tolerance of the patient must not be exceeded Baking of a joint, arm or leg, should take 30 to 45 minutes unless this is not well tolerated Heat should never cause blistering or burning of skin Thirty to 45 minutes of baking followed by 10 to 20 minutes of proper massage daily are most beneficial

The part treated must not be cooled or chilled immediately following the baking It is well to have a rest period equal in time after the baking Massage is prescribed if general treatment is being given The patient is encouraged to do joint exercises immediately after baking and massage

INFRARED LAMP Heat radiation with a generator producing a dull red penetrates from about $\frac{1}{16}$ to $\frac{1}{2}$ inch Nonluminous infrared lamps and generators consist of metal coils or plates which glow a dull red when heated because of the resistance they offer to the passage of an electrical current Such heat energy, concentrated in the superficial layers of the skin, is slowly dissipated by the underlying blood Infrared radiation of short-wave length is tolerated twice as long by average skin as that of longer wave-length ultraviolet radiation Reflectors concentrate the energy upon the part being treated Heat from this source should be directed at right angles to the part being treated and at a distance of about 2 feet.

The distance between the skin and the lamp is varied, depending on the tolerance of the patient and sensitivity of the part Infrared lamps are the least effective means of heating hands, forearms, and feet because heat loss is rapid from surfaces of the part not directly exposed.

The above methods of applying dry heat depend for effectiveness on emission of infrared rays Such lamps are more economical and easier to move about than long- or short wave diathermy This treatment is often given two to three times daily but may be used at

lesser intensity as continuous application It is useful in relieving one or two painful joints in the acute stage of arthritis or in decreasing pain, stiffness, and muscular spasm in joints of chronic rheumatoid arthritis

ULTRAVIOLET TREATMENT. Ultraviolet wave treatment is another form of therapy It is not as useful as previously outlined methods of using heat The lamp to be used is recommended by a physician Some lamps sold commercially are practically valueless Ultraviolet radiation is not harmless, and severe reactions can occur. Blonds are more sensitive than brunettes, and men more than women Eyes must be protected with dark glasses The main effect of ultraviolet radiation in arthritis is that of converting certain vitamins into vitamin D. This occurs normally in the skin. The patient with rheumatoid arthritis may not have enough exposure to the sun and, hence, needs this form of treatment

There is no evidence that any heating effect can be derived from ultaviolet radiation Sunlight is as good a source of ultraviolet rays as a lamp and is really of more value because it gets the patient outdoors Ultraviolet irradiation is not done during the acute stage of the disease In the experience of many rheumatologists, direct sunlight or ultraviolet irradiation seems to act as a tonic in patients with rheumatoid arthritis after the acute stage has passed Appetite improves and a general sense of well-being results Obviously sunlight or ultraviolet irradiation does not cure rheumatoid arthritis as has been occasionally claimed

Electricity

> **Electricity—carrier of light and power, devourer of time and space, bearer of human speech over land and sea, greatest servant of man, itself unknown.**

ELECTRIC BLANKET. The modern electric blanket, though not seeming to be one of a physician's tools, has real usefulness in

preventing or ameliorating morning stiffness of which many arthritic patients complain Some bedridden patients do especially well using an electric blanket at night or on chilly days This is highly recommended treatment for most people with arthritis

DIATHERMY AND DIATHERMY MACHINES Heat is produced when an electric current is passed through tissues The high-frequency current is the only type which is safely passed through the body at high enough intensity to raise the body temperature This is diathermy

When used, no unpleasant or painful heat sensation is produced Diathermy is not useful in acute stages of arthritis In chronic, long standing cases some improvement follows diathermy, even here there is little current enthusiasm Inflamed knee joints of rheumatoid arthritis are occasionally benefited

These more complicated techniques, short wave diathermy and microwave diathermy, have no special value in treating rheumatoid arthritic joints In some patients they are contraindicated because their use results in increased pain and discomfort This may be due to excessive temperatures, produced in inflamed membranes about the joints, bones, and deeper structures *Unfortunately the lay public is inordinately and unwisely impressed by electrical apparatus* Some re-education concerning their use is needed The simplest, least expensive methods are, as usual, the best and most effective

A new physical agent, ultrasonic radiation, is now available for clinical use Its value in rheumatoid arthritis is not established, and at present it is not employed except by physician experts More must be known about its physiological and therapeutic effectiveness Simpler methods of heating are readily controlled and available without professional supervision

Use of Hot Packs (Moist Heat)

Hot packs are applied by dipping strips of old blanket (1 to 1½ feet square), heavy towels, or woolen cloths into very hot water,

about 115° F, these are carefully wrung out and wrapped about the joint being treated, several layers of the hot blanket or towels are placed on the joint, they should extend well above and below the joint. The hot cloths on the joint are then enclosed in a layer of oiled silk, heavy waxed paper, or plastic. One or more hot-water bottles or an electric heating pad is arranged about the plastic-enclosed joint. A warmed blanket is used to hold hot-water bottles or an electric heating pad in place This prevents too rapid loss of heat and reduces need for frequent application The treatment period is from 20 to 40 minutes. This is done two or three times daily Hot packs are especially helpful for acutely painful swollen joints Several joints are readily treated at one time

In physical therapy departments in hospitals, heat is applied with Hydrocollator packs. These are flat canvas sacks, filled with a chemical substance which holds heat for longer periods (see Fig. 26) Such packs can be purchased for about $5 a pack and are available for home use. They simplify hot pack treatment in the home and are more effective than other methods

If joint pain and swelling are worse following heat the treatment should be discontinued temporarily or less of it given It may be useful at one time and not at another In general, moist heat produces more pain relief and increased mobility than dry heat.

Technique of Paraffin Application

About 4 pounds of ordinary paraffin (such as is used to cover homemade jelly jars) is melted in the upper portion of a double boiler.

Paraffin wax melts at various temperatures, the most frequent melting point of commercial preparations being 120° F. The temperature of the melted paraffin should range from 120 to 130° F In order to obtain this temperature, 4 parts of paraffin and 1 part of liquid petrolatum ("Vaseline" Petroleum Jelly) are used A bath or candy thermometer should be used to determine the



Figure 26 Application of Hydrocollator packs to the knees

temperature of the mixture, which is allowed to cool until a thin scum forms on the top.

It is now ready for use In the case of the fingers, the hands are dipped into the paraffin and removed after several seconds The fingers should be held apart while immersing the hand. The fingers



Figure 27 Hand immersed in tank of warm paraffin, fingers

must be held still to prevent the paraffin cracking when it hardens The patient must not touch the very hot bottom or sides of the container As soon as this layer of paraffin has hardened (within 5 to 10 seconds) the hands are dipped into the wax again This procedure is repeated until 8 or 10 coats have been applied The wax-coated hands are wrapped in thin plastic cloth, then a warmed blanket is placed over the cloth and left there for about 30 minutes

Because of sweating which occurs beneath the paraffin, it is

easily peeled off when desired The mixture of liquid petrolatum and paraffin may be used repeatedly as it is sterilized by the heating For hairy parts, hair must be shaved before application of paraffin, otherwise a dermatitis may result.



Figure 28. Physical therapist painting the patient's shoulder with warm paraffin

In involvement of other joints (knees, shoulders, elbows, etc), 8 or 10 coats of wax may be painted on the involved part with a paint brush or a large soup ladle wrapped in gauze It is important to be extremely careful with patients who have a thin, tender skin, since a burning sensation may be experienced from the wax To

avoid this, about 1 ounce of mineral oil is added to each pound of paraffin to lower the melting point of the mixture.

Water

> Till taught by pain men really know not what good water's worth.
>
> Lord Byron

THE USE OF HOT WATER The hot tub bath is one of the most effective means of treatment in arthritis. It is especially useful at home The time in the tub as well as the heat of the water is gradually increased It is brought up to 30 or 45 minutes. If undue weakness or recurrence of joint symptoms occurs, baths are discontinued or less heat for a shorter time is temporarily used until acute inflammation subsides. The frequency and amount of heat by tub bath are individualized and varied in its application from time to time, depending on needs of the moment. Temperature of the water is gradually raised from 95° F to as much as 105° F by repeatedly drawing more hot water. A cool towel around the head lessens discomfort from the heat. A bath thermometer records the water temperature

Baths

> A seething bath, which yet men prove against strange maladies a sovereign cure and healthful remedy for men diseased.
>
> William Shakespeare

WHIRLPOOL BATH Whirling hot water eliminates loss of heat from the part being treated Water is agitated by a motor-driven propeller. Water temperature is gradually raised This is done in a hospital physical therapy department. There are available types for home use in which an agitator is placed in the bathtub

HUBBARD TANK. A Hubbard tank is a very large tub in which patients are moved about There is a crane for lifting patients in and out. The tank is large enough to float the whole patient in a recumbent position This type of hot-water treatment is especially

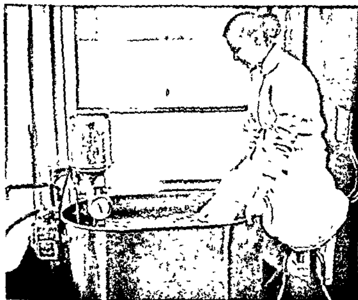


Figure 29. Whirlpool bath in a physical therapy department

valuable in arthritis with involvement of multiple joints, contractures of joints, and also arthritis of the spine Weakened muscles and joints can perform motions under water that are impossible out of water When the body is largely submerged in water, it loses as much weight as the weight of the water it displaces The buoyancy of the water largely eliminates the force of gravity It is a great boost to morale for the patient to find that he can readily move his joints and trunk in all planes with so little effort

Underwater exercises are conveniently done. Passive, assistive, or active motion of the affected joints is practiced Water temperature is increased to 104° to 106° F, if the patient tolerates it This is not done abruptly or without thought regarding the patient's



Figure 30 Hubbard tank in a physical therapy department

particular case and tolerance Hubbard tank treatment is usually a hospital procedure, although some patients have successfully built homemade tanks.

MASSAGE AND ARTHRITIS

Massage has been used as far back as people have been interested in treating muscle and joint disorders Massage consists of stroking the skin and deeper tissues in a particular way Massage at home is done only after proper instruction by a physician or a trained physical therapist

Gentle stroking massage induces muscular relaxation, whereas rapid, deep stroking causes muscle contraction Massage causes increased blood flow and, hence relief of pain and discomfort Many cases of rheumatoid arthritis have spasm of small blood vessels, and increased blood flow incident to dilation of these vessels is very beneficial Muscle tone is also improved It is emphasized that muscle strength is not increased This is accomplished only by active exercise on the part of the patient

Movements used in massage include stroking, light or superficial, medium or deep, compression including kneading and friction, percussion, or slapping, tapping, or gentle beating, and, lastly, vibration

Very light stroking is employed at the beginning of each treatment, hands are passed lightly over the skin in a centripetal direction. Movements are smooth and rhythmical, at a speed which does not exceed 15 strokes per minute Experience is gained through practice, a delicate sense of touch guides the therapist's judgment in the amount of pressure to compress any structure

In the acute painful stage no massage is indicated As swelling heat, and redness subside, gentle stroking and then deeper stroking motions with kneading and friction of surrounding muscles are done, 10 minutes twice a day Only superficial light stroking is started over the joint This is best performed after 15 minutes of heat to the tissues If it causes pain, it is discontinued temporarily

The average time for massage is 5 to 10 minutes for an arm, 10

minutes for a leg, and then 10 to 15 minutes for the back. It is always best to give too little rather than too much massage.

Room temperature should be 70° F or more. Only the part being treated is exposed, keeping the remainder of the body covered The patient is recumbent, and the part to be massaged is relaxed If hairy parts are massaged, the skin is best shaved Heat precedes massage It is impossible to do adequate self-massage

REST AND EXERCISE IN ARTHRITIS

The wise, for cure, on exercise depend.
John Dryden

Therapeutic exercise is one of the most important aspects of the comprehensive program. *Proper use of treatment exercises requires specialized technical knowledge imparted by a physician or a trained technician* Patients often feel they may be doing considerable exercise in their work; actually, the exercising they do may accelerate deformities. Exercises are individually prescribed. Regular exercise periods are necessary. It is difficult to convince the *patient of the necessity to take exercises, careful* explanation and repeated evaluation of the technique are mandatory. Ultimately enough skill and understanding are acquired so that checks and further instruction are not so necessary.

Proper exercise-rest balance is achieved only if the patient is convinced of the need for exercise. Local corrective exercise measures are prescribed to fit the part and the patient. Muscle setting, stretching, and coordinating action to the widest possible range of motion are used Undue fatigue or increased pain is to be avoided If exercise results in pain for more than 30 to 60 minutes afterward it is too much It is accordingly reduced but not stopped. The amount of ambulatory exercise is governed by the degree of intensity of arthritis in weight-bearing joints

Increase in muscle bulk and acquisition of new muscle strength

are recorded by measuring the circumference of the joint above an[d] below it with a tape measure. This is important since it provides th[e] patient with a guide to his improvement. Range of motion may b[e] checked frequently with a measuring instrument by therapist o[r] doctor.

In establishing an exercise program, it is important for the patient to understand the objectives. He may be confused by the *emphasis on need for additional rest at the same time exercises are being prescribed.* Exercises do increase muscle strength but this is not their primary purpose; their main function is to prevent deformity and to maintain a normal range of joint motion. If the patient is limited in activities or confined to bed, many joints are used in only a limited range and they insidiously develop restricted joint motion that is very difficult to regain.

For the severely ill patient with marked arthritis activity and multiple joint involvement, the early period of exercise may be limited to passive maximum range of motion of all major joints. However, most patients can begin with active exercises in bed. These are performed lying on the back, in all normal ranges of joint motion. At first, two to three repetitions of each motion are carried out three times daily. Later, this is increased to as much as 10 or 12 repetitions of each motion in each of the three exercise sessions. Some joint discomfort is expected, especially at the extremes of motion. If pain does not persist no change in the program is necessary. Each motion is done slowly and deliberately in order to achieve maximum range of motion wherever possible. Special attention should be given to the big thigh muscles (quadriceps) and buttock muscles because they tend to weaken rapidly in the bed patient. Simple tightening or contraction, holding them for a few seconds ("setting exercises"), done at frequent intervals during the day aids in maintaining strength in these important muscles. When the activity of the disease has diminished, a more vigorous exercise program can be instituted.

Rest has been discussed previously (pp. 91-96). Exercises are of several types:

1 *Passive exercise* occurs when a member of the family moves the part and the patient does nothing, except relax. This precedes active movement or is used when active contraction of muscle is contraindicated Adhesions and shortening of muscles are thus prevented. It is used most commonly for bedfast patients

2 *Muscle setting* means that the patient makes efforts to contract his muscles, to hold them for a few seconds, and then to release them This is especially useful about painful swollen joints whose muscles can be contracted without moving the joint.

3 *Active exercise* is movement carried out by the patient himself This is the most common form of therapeutic exercise. Physician or technician directs special attention to muscle groups requiring strengthening or retraining in coordination

4. *Resistive exercise* is the type in which the technician resists efforts of the patient to move the part.

THERAPEUTIC EXERCISES

BASIC POSTURAL EXERCISES The goals of exercises are a buildup, of both joint range of motion and muscle strength. Muscle power and joint stability must be restored before joints are subjected to the strain of functional use and weight bearing The postural exercises are more general, aimed at relief of fatigue, muscle spasm, and pain due to poor posture, an almost inevitable consequence of having painful swollen joints With relief of general pain, fatigue, and stiffness, more attention and time can be given to specific joints and muscles

A point that is important and must be clearly understood is that the *exercise part of the treatment program is quite individualized* By no means should a person set out to do all the exercises listed in the following pages. Specific exercises, frequency and duration of performance, and amount of rest in between are all prescribed

by the physician or clinic In certain types and stages of rheumatoid arthritis, exercises can be damaging if done too vigorously and too often. Thus, the patient is cautioned to carry out exercises only under supervision When properly done, exercises constitute a very important aspect of treatment

1 Lying on back—legs straight Tighten buttock muscles, retract or pull in abdominal muscles flattening the abdomen Do not hold breath An effort should be made to get the lower back flat against the bed, thus straightening out the curve of the lower back. This exercise may also be done lying face down, with a pillow placed under the abdomen It represents the starting point from which the following basic postural exercises are built.

2 Lying on back—hands clasped on back of neck, if possible Repeat exercise No 1 Hold position and slowly bend one knee sliding one foot back, and then the other Hold back flat and slowly slide feet out until legs are extended

3 Lying on back—arms crossed on chest Tighten buttock muscles, retract abdomen Raise head and shoulders 6 to 8 inches from bed

4 Lying on back—hands at sides Tighten buttock muscles, retract abdomen Raise arms over head and inhale Keep back flat Lower arms and exhale

5 Lying on back—arms at sides Tighten buttock muscles, retract abdomen Roll arms outward turning palms upward and forcing shoulders back Keep lower back against bed Try to press back of neck against bed, keeping chin in

6 Lying on back—hands in back of neck if possible Tighten buttock muscles, retract abdomen Alternate straight leg raising and lowering Do slowly

7 Standing back against wall heels 3 inches from wall, feet 3 inches apart Hands in back of neck Bend knees, tighten buttock muscles and retract abdomen Hold back flat against wall and straighten knees

8 Lying face down—pillow under abdomen—arms, should-

high, and elbows bent to a right angle. Tighten buttock muscles, retract abdomen, raise arms and hands from bed bringing shoulder blades together

EXERCISES FOR THE HAND AND WRIST. The aims of these exercises are to maintain and regain finger and hand dexterity, to prevent adhesions in joints and to stop a developing deformity; to reduce pain and increase muscle size and strength, to improve nerve-muscle coordination in this most important structure, the hand

1 Make a fist.

2 Stretch the fingers as straight as possible Then if the fingers remain bent, rest hand palm down on table Hold other hand firmly on top of it and raise forearm of affected hand in effort to extend bent fingers

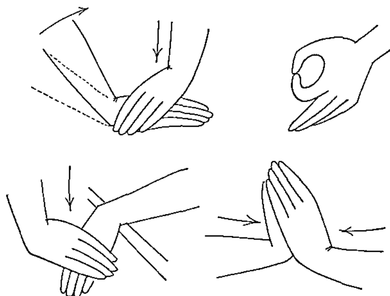


Figure 31. Exercises for the hand and wrist, (upper left) step 2, (upper right) step 4, (lower left) step 8, (lower right) step 9

3. Spread the fingers apart
4 Touch the tip of each finger to the end of the thumb, making as round a circle as possible (Fig 31)
5 Bend wrist forward and back as far as possible
6 Move fingers of hand toward thumb and touch, spring them apart sharply
7. Turn wrist slowly back and forth as though turning a doorknob
8 Resist flexion and extension as in Figure 31
9 Hold hands flat together as in Figure 31, and press hard

EXERCISES FOR THE ELBOW The objective here is to prevent flexion deformity of the elbow and to maintain maximum extension and flexion of the elbow joint An improperly flexed (bent) elbow joint may preclude bringing the hand to the face and head, obviously this interferes with such basic needs as eating, face care, shaving, and hair combing, thus, the great importance of maintaining good elbow motion Good muscle power is also necessary to turning the hand and forearm up and down (palm up and palm down). These exercises tend to maintain this motion

1 With the upper arm resting on the bed, bring fingers to the top of the shoulder
2 With palm turned up, bring hand down to bed, straightening elbow.
3 Press against wall 3 to 5 times (Fig 32)
4 Push with one hand against opposite heel of the other hand with elbow held as rigid and straight as can be (Fig 32)

EXERCISES FOR THE SHOULDERS The shoulder has the widest range of motion of all joints If it becomes restricted in its motion, most upper extremity activities will be compromised or impossible The shoulder exercises are especially designed to maintain proper muscle balance between the many opposing muscle forces that enter into function of this complicated joint The shoulder joint capsule and the ligaments surrounding the shoulder joint readily develop adhesions, the exercises prevent this Failure to use the

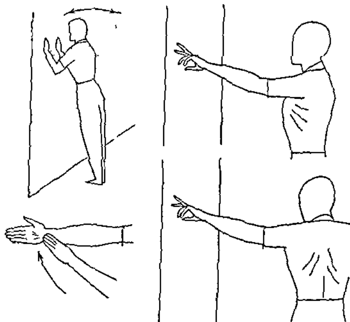


Figure 32. (*Left*) Exercises for the elbow; steps 3 and 4. (*Right*) Exercises for the shoulder, step 4.

many muscles of the shoulder results in weakness and wasting in this area The exercises make all contributing muscles work, gain power and strength,

1 Arms resting at sides, palms toward body:

(a) Raise the arm sideways as far as possible away from the body, and then return

(b) Raise the arm forward, upward, and as far back as it will go; then return

(c) Lying on back, legs straight, arms at sides: Raise the arm forward, upward, and as far back as it will go, then swing the arm out to the side and around back to the side of the body.

2. *Standing at edge of bed:* Make an increasingly large circle with the hand, keeping the elbow stiff. Repeat with other arm.

3 Shrug shoulders in an upward, downward, and circular motion

4. Creep up side of a wall with the fingers, reaching higher each day First, with the arm extended directly in front of the body, second, with the arm extended sideways (Fig 32 right)

5 Place the hands at the back of the neck, then, keeping the elbows bowed, bring the hands forward downward, and backward to the lower part of the back (Fig 33)

EXERCISES FOR THE ANKLE The ankle joint is an important weight bearing joint, it is often involved in rheumatoid arthritis

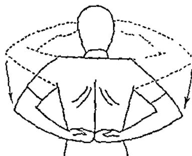


Figure 33 Exercise for the shoulder, step 5

When the joint is painful the tendency is to walk with the ankle held rigid, this in turn tends to allow the joint to become fixed and immobile. The exercises are designed to bring into play all muscles regulating ankle joint function, taking it through its maximal range of motion several times daily This prevents undue fixed tension of the large muscles of the leg In the long run this preserves the joint for adequate weight bearing when the inflammation, heat, and swelling have subsided

1 Bend foot up and then down slowly

2 Alternate turning foot in and out slowly.

3 Sitting on edge of bed Move foot through circular motion

4 Put strap or folded towel under fore part of foot Flex ankle by

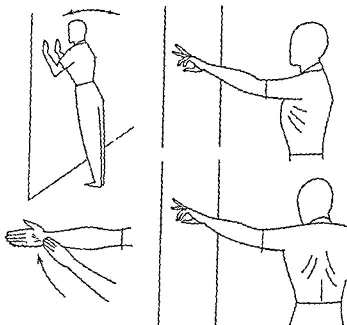


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(a) Raise the arm sideways as far as possible away from the body, and then return.

(b) Raise the arm forward, upward, and as far back as it will go, then return.

(c) Lying on back, legs straight, arms at sides: Raise the arm forward, upward, and as far back as it will go, then swing the arm out to the side and around back to the side of the body.

2. Standing at edge of bed: Make an increasingly large circle with the hand, keeping the elbow stiff. Repeat with other arm.

3 Shrug shoulders in an upward, downward, and circular motion.

4 Creep up side of a wall with the fingers, reaching higher each day First, with the arm extended directly in front of the body, second, with the arm extended sideways (Fig 32, right)

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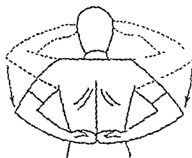


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1 Bend foot up and then down slowly
2 Alternate turning foot in and out slowly
3 Sitting on edge of bed Move foot through circular motion
4 Put strap or folded towel under fore part of foot Flex ankle by

pulling ends of bandage. Press against the resistance several times (Fig. 34)

5. Stand against wall with back and heels touching, slide down wall, bending knees and necessarily ankles (Fig 34).

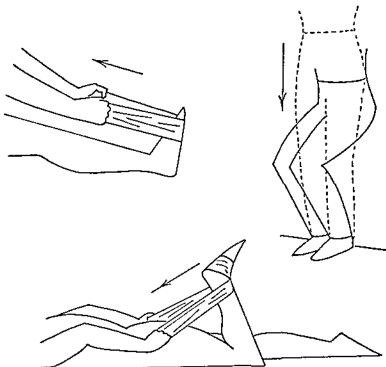


Figure 34 Exercise for the ankle (*top, left and right*) steps 4 and 5 Exercise for the knee, (*bottom*) step 5.

EXERCISES FOR THE KNEE The knee joint is the most commonly involved of the large joints The movements of the knee joint are flexion, extension, and rotation in semiflexion. If the knee joint becomes permanently flexed, walking is not possible. Thus, it is of *the utmost importance to maintain complete knee function* and

motion Permanent *knee or hip flexion with fixation is the commonest cause of bedfastness in arthritis* The exercises prevent development of these deformities The very large muscles of the thigh are the main regulators of knee joint mobility The exercises help maintain and regain muscle strength and size

1 Lying on back, legs straight, contract the muscles of the entire leg, tightening the kneecap and flattening the knee down on the bed

2 Sitting on a rigid bed or table with the legs hanging over the edge and above the floor, slowly raise and lower feet alternately (sandbags of increasing weight may be hung over the feet)

3. Sitting on a bed with legs straight, raise the knee off the bed sliding foot back on bed and return to straight position

4. Lying on back, bicycle legs

5 Lie on abdomen Make a complete turn of strap or folded towel around foot and ankle Grasp both ends of bandage and attempt to flex the knees by pulling on the bandages (Fig 34)

EXERCISES FOR THE HIP Maintenance of hip motion is essential for weight bearing and walking In arthritis of the hip joint, fusion may occur restricting the several hip motions, flexion, extension, and internal and external rotation as well as abduction and adduction The hip joint is a ball-and-socket joint and is spoken of as polyaxial, meaning it moves in many axes The range of movement may become limited in any or all directions, the most usual deformity is a combination of flexion, adduction, and lateral rotation The exercises are especially designed to prevent these deformities by bringing into play muscle groups that oppose them These are of the greatest importance to long-range preservation of function

1 Lying on back, holding the legs straight, move the leg 15 inches to the side and return

2 Lying on back, raise and lower legs slowly, first with the knee straight and then with the knee bent

3 Lying face down, lift leg backward, keeping knee straight

4. Stand beside a table Rest the buttock and leg of one side

along the edge of the table, allowing the other leg to swing free Swing the affected leg back and forth from the hip Alternate (Fig 35)

5 Sit with the legs straight Attempt to touch toes with the hands by bending forward, holding trunk rigid

EXERCISES FOR THE FOOT. The many joints of the foot may be arthritic, they all contribute to the ability to adapt to walking on uneven surfaces The muscles and joints of the feet and toes provide balance and spring to the step The range of motion in the foot joints is very small, that of the toes is greater. These basic foot

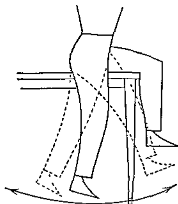


Figure 35 Exercise for the hip, step 4

exercises maintain muscle strength in the foot, prevent adhesions and muscle wasting, decrease swelling, and augment circulation in the foot.

1. Sit in a chair. Let feet rest parallel on towel. Gather the towel under the feet with the toes

2 Sit in a chair Grasp marble with toes, turn the fore part of the foot inward, carry the marble toward the other foot and drop in a dish *Pick a handkerchief off the floor with the toes*

3 Stand on toes and take six to eight steps. Then stand on the heels and do the same.

4 Stand on a step with toes projecting over edge, bend toes down, spring them out straight as vigorously as possible

STRETCHING EXERCISES These exercises are for the purpose of increasing general muscle tone and relieving fatigue thereby Contraction is the only means by which muscle power can be maintained and improved The muscles used in these exercises in general might not come into the exercise program and are, thus, put in here as stretching exercises

1 Lying on back, legs straight, flatten the neck against the bed by making a double chin, and at the same time stretch up toward head of the bed

2 Sit with legs straight out and attempt to touch toes with hands by bending forward This exercises the muscles in the back of the legs It is also a good exercise for maintaining hip motion

3 Lying on back, knees bent, feet on the bed, raise the knee towards the chest, straighten the knee by lifting the foot in the air, stretching up with the heel, let the knee bend and the foot return to the starting position Alternate with opposite knee and foot

4 Lying on back, legs straight, turn the head as far as possible to one side, stretch the head up, keeping the shoulders flat on the bed Return to a straight position and rest Repeat, turning head to other side

5 Neck muscles by using a sling which works over a pulley attached to the head of the bed or is hung from a door, it is possible to stretch the neck muscles and counteract a tendency to abnormal curvature of this region The sling is a satisfactory form of treatment for chronic neck and shoulder pain, so common among arthritics (Fig 23)

EXERCISES AND CARE OF THE BED PATIENT When the arthritic patient is confined to bed he should be on a [illegible] mattress He practices postural exercises three [illegible] day. [illegible] is removed from under the head, and th[illegible] [illegible] position with the hands placed beh[illegible] [illegible]k or [illegible]

SHOULDER. Shoulder deformity is prevented by avoiding use of more than one pillow beneath head, neck, or back. A firm mattress is necessary. In acute arthritis the arm is about 90 degrees from the body during rest periods. This is maintained in bed by pillows or a platform splint. Tendency to forward dropping of the shoulder occurs commonly in shoulder arthritis and is prevented by these methods.

SPINE. Spine deformity treatment and prevention require a firm bed. The patient lies on his back 30 minutes after each meal with hands beneath head. A pillow is placed under the knees to flatten the spine. Later a small pillow is used under the spine in the chest area to combat forward bowing of the spine. Occasionally a plaster shell is molded over the back. This is not commonly needed. Breathing exercises, back stretching exercises, and later postural exercises are done two or three times daily. A spinal brace with shoulder straps is temporarily or permanently helpful.

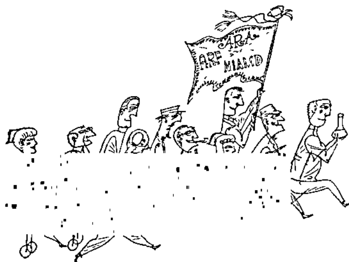
ELBOW. The commonest deformity of the elbow is that of flexion. This is prevented by use of a splint, intermittently applied. Active specific movements of the joint are done every day. Special exercises and physical therapy are instituted as early as possible.

WRIST AND HAND. Wrist and hand deformities are prevented by a cockup splint from the upper forearm to the finger tips, holding the wrist in 35-degree extension with fingers only slightly flexed. Special exercises and occupational therapy for the hands are important. If the wrist is so damaged that it becomes rigid, one should take the greatest care that it becomes so with the wrist cocked up. This position provides a much more useful hand.

KNEE. Knee deformities are the most common. A splint molded over the leg and changed frequently enough to maintain gains is the best preventive. The splint is removed several times daily for hot packs and exercises. Hot packs are used 20 to 30 minutes several times a day. Muscle setting and nonweight bearing exercises are done until the acute inflammation has subsided. As improvement occurs, periods of splinting are gradually reduced so that splinting is required only at night. Weight bearing is avoided until the acute,

inflammation subsides and a period of exercises without weight bearing produces no harmful effects. Leg muscles must be in condition to support body weight. *The patient should not walk with a flexed knee joint*, distortion is produced in both lower extremities and in the trunk by premature walking. *Walking is avoided until the patient is able to hold the extended leg horizontally without support while sitting.* During the first weeks or months of walking it may be best to use a stiff-legged brace. Muscle massage, avoiding the joint itself, is begun within 24 hours of the period of original splinting except in very acute arthritis. *Massage never replaces exercise.*





Chapter 9

WAR AGAINST RHEUMATISM

The present is the golden age of rheumatism There is more interest, enthusiasm, and organized effort to combat it than ever before in the history of mankind The earliest organized group to attempt a campaign against rheumatism was called the Cambridge Committee for the Study of Special Diseases in England during World War I In 1920 La Ligue Internationale contre le Rheumatisme was established with its headquarters at The Hague, The Netherlands This small group, made up originally of European representatives, encouraged establishment of groups interested in rheumatism in other countries The movement extended to the United States in 1928 with formation of the American Committee for the Control of Rheumatism American physicians on this committee of La Ligue Internationale contre le Rheumatisme worked very actively to excite interest of the profession in the magnitude of

the vast social and economic problems presented and to extend knowledge of rheumatic diseases.

By 1930 when it was apparent that a national society for study and control of rheumatic diseases was needed, the American Rheumatism Association was founded. Since then the association has held yearly scientific meetings, and more recently interim meetings have become necessary to keep abreast of developments, so rapidly are they now appearing It conducts and publishes extensive reviews of world arthritis literature each few years, and promotes wider interest and more precise knowledge concerning rheumatic diseases; it holds scientific meetings at which basic research studies are presented, and it enlists aid of nonprofessional and governmental agencies in dealing with the social and economic aspects of rheumatism There are now many affiliated societies in states, regions, and at local levels The Ligue Internationale contre le Rheumatisme held its Eleventh International Congress in June of 1957 where representatives from more than 40 countries of the world convened to exchange knowledge and compare progress reports of the past few years.

Just before the United States entered World War II a committee of the American Rheumatism Association was appointed to study the possibility of establishing a national fund-raising effort, to support research, teaching, and patient care in rheumatic disease. This important undertaking was delayed by the outbreak of war, but at the war's end rapid progress was made

If any real progress toward cure is made, basic research must be supported in a major way. Research is the soundest approach to solving the problems of rheumatism Raising money for research and allied activities dealing with education and basic investigation is more difficult than raising money to be spent directly on sufferers A man next door in bed or in a wheelchair doesn't see much point in investigating arthritis in a guinea pig or a test tube. However, in the long run he benefits, cure, rather than alleviation, is finally attained.

As a result of this kind of thinking, a national voluntary health organization, the Arthritis and Rheumatism Foundation, with headquarters in New York, was established in 1948, with a board composed of physicians and laymen During the last 11 years a nation-wide network of chapters has been created so that a chapter of the Arthritis and Rheumatism Foundation now exists in practically every state in the Union and in most larger cities

The purpose of the foundation is threefold it promotes basic research, public and professional education, and the establishment and expansion of local treatment facilities A national Medical and Scientific Committee, on which outstanding scientists and rheumatologists from all over the country are represented guides the medical policies of the foundation Research awards are an important part of the national medical program Numerous printed materials, manuals, guidebooks, conferences, forums, and seminars serve the purpose of helping the general public to distinguish between facts and fables about arthritis and to bring the latest professional knowledge to medical students, nurses, interns, and physicians

The furtherance or expansion of local diagnostic and treatment facilities is another essential responsibility of the foundation Among these local activities are home care programs, craft shops, back-to-work or vocational guidance programs, and other rehabilitation services

Laymen and physicians, bound together in a solid partnership, have organized this attack against arthritis and rheumatism To-day, better and more numerous facilities are available to arthritics, and wider knowledge is being gained and spread to the profession and the public at large It can safely be said that this is in n small measure due to the efforts of the Arthritis and Rheumatism Foundation and its chapters

In 1950 the Eighty first Congress of the United States throu Public Law 692, known as the Omnibus Medical Research A provided among other things for the establishment of a resea

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The purpose of the foundation is threefold: it promotes basic research, public and professional education, and the establishment and expansion of local treatment facilities. A national Medical and Scientific Committee, on which outstanding scientists and rheumatologists from all over the country are represented, guides the medical policies of the foundation. Research awards are an important part of the national medical program. Numerous printed materials, manuals, guidebooks, conferences, forums, and seminars serve the purpose of helping the general public to distinguish between facts and fables about arthritis and to bring the latest professional knowledge to medical students, nurses, interns, and physicians.

The furtherance or expansion of local diagnostic and treatment facilities is another essential responsibility of the foundation. Among these local activities are home-care programs, craft shops, back-to-work or vocational guidance programs, and other rehabilitation services.

Laymen and physicians, bound together in a solid partnership, have organized this attack against arthritis and rheumatism. Today, better and more numerous facilities are available to arthritics, and wider knowledge is being gained and spread to the professions and the public at large. It can safely be said that this is in no small measure due to the efforts of the Arthritis and Rheumatism Foundation and its chapters.

In 1950 the Eighty-first Congress of the United States throu
Public Law 692, known as the Omnibus Medical Research A
provided among other things for the establishment of a resea

the vast social and economic problems presented and to extend knowledge of rheumatic diseases.

By 1930 when it was apparent that a national society for study and control of rheumatic diseases was needed, the American Rheumatism Association was founded Since then the association has held yearly scientific meetings, and more recently interim meetings have become necessary to keep abreast of developments, so rapidly are they now appearing It conducts and publishes extensive reviews of world arthritis literature each few years, and promotes wider interest and more precise knowledge concerning rheumatic diseases, it holds scientific meetings at which basic research studies are presented, and it enlists aid of nonprofessional and governmental agencies in dealing with the social and economic aspects of rheumatism There are now many affiliated societies in states, regions, and at local levels The Ligue Internationale contre le Rheumatisme held its Eleventh International Congress in June of 1957 where representatives from more than 40 countries of the world convened to exchange knowledge and compare progress reports of the past few years

Just before the United States entered World War II a committee of the American Rheumatism Association was appointed to study the possibility of establishing a national fund-raising effort, to support research, teaching, and patient care in rheumatic disease This important undertaking was delayed by the outbreak of war, but at the war's end rapid progress was made

If any real progress toward cure is made, basic research must be supported in a major way. Research is the soundest approach to solving the problems of rheumatism Raising money for research and allied activities dealing with education and basic investigation is more difficult than raising money to be spent directly on sufferers A man next door in bed or in a wheelchair doesn't see much point in investigating arthritis in a guinea pig or a test tube. However, in the long run he benefits; cure, rather than alleviation, is finally attained

its services with those of other community health and welfare agencies.

The most recent addition to the forces in the war against rheumatism is the National Foundation for Infantile Paralysis In 1952 Dr. Jonas E Salk of the University of Pittsburgh reported results from his laboratory suggesting that a successful vaccine against paralytic poliomyelitis could be produced The events since that time have proven that this is so This health problem is much less of a major national concern now The National Foundation for Infantile Paralysis, having achieved greater success than any other voluntary health organization, then began to explore the next most urgent health problems By virtue of extensive exploratory studies this foundation decided on entering the arthritis field as one extension of its program This major decision was reached the summer of 1958 The perceptive and farseeing men who administer The National Foundation (as it is now called) saw the importance and magnitude of the arthritis problem This great addition to already existing forces surely will tremendously accelerate progress in education, research, and practical treatment of the rheumatic diseases.

World wide attention is being focused on the role of physical medical measures in restoration of the disabled arthritic to activities of daily living The program of education sponsored by such groups as the United Nations, World Veterans Federation in Paris, and the International Society for the Welfare of Cripples has changed the public attitude toward rehabilitation from one of fear and aversion to a rising hope The Institute of Physical Medicine and Rehabilitation at New York University-Bellevue Medical Center has shown the indispensable role of integrated efforts of medical, surgical, and physical therapy—and of occupational therapy, psychotherapy, and vocational training in rehabilitation of the disabled arthritic patient Other centers of such broad comprehensive rehabilitation are now operating in Boston, Chicago, Kansas City, Santa Monica, and Vallejo

institute devoted to the study of arthritis and metabolic diseases. An institute was created and called the National Institute of Arthritis and Metabolic Diseases. It is one of seven medical research institutes located in Bethesda, Maryland These Institutes are known collectively as the National Institutes of Health. This organization is the principal research arm of the United States Public Health Service.

The National Institute of Arthritis and Metabolic Diseases created within the Public Health Service has as a primary responsibility the conduct of research in rheumatic and metabolic diseases, to assist and foster such research in nonfederal institutions, and to support programs of education, instruction, and training in diagnosis, prevention, treatment, and rehabilitation in these disorders

The National Institute of Arthritis and Metabolic Diseases is organized administratively into three major divisions representing laboratory research, clinical investigation, and extramural programs The Institute is administered with the help and guidance of a National Advisory Council composed of physicians and laymen representing broad professional and public interests Physicians serving on the National Advisory Council are usually members of both the American Rheumatism Association and the Medical and Scientific Committee of the Arthritis and Rheumatism Foundation Thus, there are proper and effective cooperation and integration of total efforts of these three large organizations devoted to the study and ultimate cure of arthritis.

The Canadian Arthritis and Rheumatism Society has pursued a similar course with regard to improving facilities for treatment of patients with arthritis by establishing effective educational programs and supporting and fostering research. In addition, the Society helps to establish physiotherapy treatment centers and also assists general hospitals in establishing arthritis clinics in outpatient departments To the greatest extent possible, the Society tries to meet the needs of the individual patients and to coordinate

GLOSSARY

abduction. To move an extremity away from the body

acromegaly An endocrine disease characterized by bony enlargement rheumatic complaints may dominate the clinical picture

ACTH Adrenocorticotrophic hormone, the hormone of the pituitary gland which stimulates the adrenal gland to produce steroid hormones

adduction To move an extremity toward the body

agglutination test. Blood test to determine the presence of a protein substance which identifies a particular disease The protein appearing in the patient's blood is a part of the body's defense reaction Such tests are widely used in many diagnostic circumstances including rheumatoid arthritis where the protein is called rheumatoid factor, its precise significance is unknown

arthralgia Painful joints

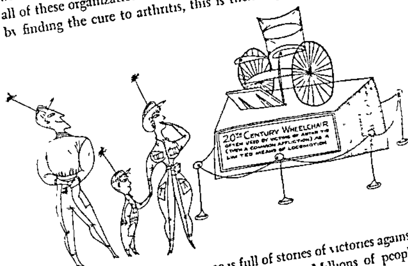
arthritis Inflammation of a joint, characterized by heat, redness, and swelling, not a particular disease

arthrodesis The operative fusion and permanent immobilization of a joint in the best position for use

arthroplasty. An operation to form a new, movable joint when it has become fused and immobile by disease, especially used when the joint surfaces are greatly distorted

bacteria Microscopic organisms, tiny plants, some quite harmless, others producing disease

At long last there is a nation-wide, indeed, world-wide, program carrying on a vigorous organized attack on this group of serious diseases afflicting so many millions. Great faith in results of such a program is justified. When necessary research, correlated with education, is carried out vigorously and diligently on a wide enough scale, the basic answer to cause and cure of arthritis will be forthcoming Coordination of efforts between the several organizations will ensure ultimate answers. It is believed that before many years all of these organizations will have done themselves out of business by finding the cure to arthritis, this is their hope and goal.



The history of medical science is full of stories of victories against diseases which were once thought incurable Millions of people are alive and well today who would have died 30 years ago of incurable diseases One can be optimistically certain that victory against arthritis will be achieved A most enthusiastic medical leader in the war against rheumatism has said, "A problem older than history has suddenly encountered the rise of a national voluntary agency, the advent of more effective therapy, and the establishment of a federal program of arthritis research. We have entered a new era of medical study and practice in this field"

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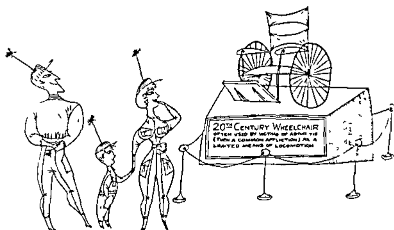
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eburnation Extreme hardening of cartilage

elastin One of the fiber elements of normal connective tissue, it is found mainly in large blood vessels

electrotherapy. The use of various forms of electricity in treatment, for example, diathermy which produces local heat in body tissues below the surface

extension. To straighten a joint

fascitis Inflammation of fascia, or the fibrous tissue that is found in largest amounts in the subcutaneous tissues

Felty's syndrome A special form of rheumatoid arthritis characterized by an enlarged spleen and a low white blood cell count

fibroblasts. Connective tissue cells which probably are the source of the connective tissue matrix and the fiber components

fibrositis A common form of rheumatism, either generalized or localized, of unknown cause, it may occur at any age level and is mainly characterized by pain in connective tissue structures

fibrous tissue. Tissues of the body made up largely of the fiber elements of connective tissue, scar tissue, tough, strong tissue of high tensile strength

flexion To bend or contract inward, e g , flexion deformity, a contracted joint

gold salts. The salts of the metal gold used in the treatment of rheumatoid arthritis

Goldthwait back brace. A large well padded frame brace for the back, it is used to hold the spine rigid

gout A metabolic or chemical disease due to an abnormality of the metabolism of uric acid, a normal constituent of body fluids

Heberden's nodes Hard lumps occurring in the end joints of the fingers in osteoarthritis, named for a famous British physician

heliotherapy. Use of the sun's rays in treatment, for example, ultraviolet ray treatment

hemophilia. A sex linked hereditary disease occurring only in males but transmitted by females, characterized by impaired blood clot-

blood count. The counting of the number of red and white blood cells in a given amount of blood.

bursa. A fluid-containing sac about a joint, probably functioning as a cushion

bursitis Inflammation of a bursa, characterized by heat, redness, and swelling (a common form of localized fibrositis). Most commonly affected are bursae about the shoulder joints, any bursa about a joint may become inflamed.

Charcot joint. A joint so destroyed that it is flail-like

chondroblasts. Cartilage-forming cells.

chrysotherapy Treatment of rheumatoid arthritis by injection of gold salts

cockup splint. A light plaster, aluminum, or plastic splint usually used on the wrist Its purpose is to hold the wrist in a slightly cocked-up position, the position of maximum function.

collagen. One of the fiber elements of normal connective tissue; a complex protein which, when in normal molecular arrangement, forms a long-chain protein compound having extremely high tensile strength, the majority of bone, skin, and tendon is made up of collagen

collagen diseases A name given to four systemic diseases of the connective tissue system (lupus erythematosus, scleroderma, dermatomyositis, periarteritis nodosa)

connective tissue. The supporting tissues of the body making up much of the total tissues of the body It is composed of three essential elements—a "ground substance" or matrix of highly viscous nature; three fine fiber elements which are named collagen, reticulin, and elastin, and cells which are called fibroblasts, chondroblasts, and osteoblasts, which probably secrete and form ground substance as well as the fibers, the site of abnormality in many rheumatic diseases

degenerative joint disease (osteoarthritis). A major rheumatic disease extremely common, principally involving joint cartilage

dermatomyositis. A systemic disease of the connective tissue, involving most extensively skin and skeletal muscles, cause is unknown, the onset is usually insidious and is characterized by fatigue, fever, weakness, and muscle and joint pain

...ritis nodosa. A diffuse disease of the connective tissue system occurring more commonly in middle-aged men extremely variable in its course, of unknown cause. It is characterized by fever, weakness, fatigue, and inflammation of small blood vessels

...enylbutazone (Butazolidin). A drug used in the treatment of many rheumatic states, having some anti-rheumatic properties and strong analgesic properties

platform splint. A light plaster splint especially made for the shoulders. It supports the arm in a position approximately at right angles to the body. It is not commonly used in the treatment of arthritis

Pott's disease. Tuberculosis of the spine

psoriasis. A chronic skin disease involving the fingernails, toenails, and spotty areas of the skin, especially ... appear about knees and elbows, it is occasionally associated with arthritis

red blood cells. The cells of the blood which carry oxygen and discharge carbon dioxide, they are essential for proper respiration

reticulin. One of the three fiber elements of normal connective tissue, a protein compound

rheumatism. A broad term encompassing the rheumatic or connective tissue diseases

rheumatoid factor. A protein substance found in the blood of patients with rheumatoid arthritis. It is not known whether it is an antibody, enzyme, or nonspecific protein substance. It causes sensitized cells or particles to clump together in the agglutination test for rheumatoid arthritis

rheumatologist. A physician specializing in rheumatology, a subspecialty of internal medicine

rheumatology. The science of connective tissue disease

rickettsia. Microscopic to submicroscopic organisms producing specific diseases in animals and man, e g , Rocky Mountain spotted fever and typhus

rotation. To rotate a joint in a circular motion

salicylates. A family of drugs in which aspirin is the most common member, others include sodium salicylate and methylsalicylate. These drugs exert a definite antirheumatic effect on connective tissues, and are good analgesics

scleroderma. A generalized connective tissue disease, usuall

hepatitis, infectious. A viral disease of the liver usually resulting in jaundice.

hyaluronate (hyaluronic acid). Mucin, a complex sugar, long-chain molecule with alternating molecules called glucosamine and glucuronic acid both of which are closely related to sugar, normal constituent of joints, usually called mucin; probably present in most tissues

intern. A graduate of a medical school who spends one year in hospital training before beginning further specialization or practice.

internist A specialist in the broad field of internal medicine who has had four years of medical college training, an internship, and three to six years of specialty training

loose bodies ("joint mice"). Small lumps of clotted material or loose pieces of cartilage within joints, may become calcified

lumbago A general term for an attack of pain in the low back, a form of fibrositis

lupus erythematosus A generalized systemic disease involving the connective tissue system, of unknown cause, usually manifesting an erratic course, a serious disease

mast cells. Cells found in connective tissue

metabolism. A comprehensive term referring to the sum of chemical processes in the body through which energy is produced, new tissue is built, repair is accomplished, and wastes are eliminated

microwave diathermy. A form of diathermy utilizing very short wave lengths.

myositis Inflammation of muscle, resulting in pain, tenderness, and stiffness

[illegible] of a nerve trunk or fiber

not involving joints

ochronosis A rare hereditary disease in which certain pigments are deposited in cartilage, resulting in a form of arthritis

osteoblasts. Cells concerned in the formation of bony tissue.

Appendix I

HOPE FOR THE ALREADY DISABLED: SELF-HELP DEVICES

There are many people with long standing relatively inactive rheumatoid arthritis, who have sustained irreversible severe damage to joints This is unfortunate, but by the use of a wide variety of clever and ingenious devices some degree of independence and self-sufficiency is still a realistic objective Permanent flexion deformities of joints, for instance, may interfere with such a simple activity as dressing, may keep a patient homebound or wheelchair bound, may make him dependent on others for bathroom use, may necessitate feeding the patient or helping him in and out of bed Such impediments make the difference between independent living and a dependent state One severely deformed joint, e g a knee, can result in great social and economic dependence The fitting and prescription of self-help devices may be a major turning point in a severely disabled person's life

Self-help devices never replace a good comprehensive home care program As few devices as possible are prescribed They are usually simple to use and operate Many have been designed by patients, others by engineering experts to help solve problems of rehabilitation

In terms of efficiency as a machine, the human body is grossly

middle life, it is mainly manifested by thickening of connective tissue of skin, lungs, and intestinal tract

sedimentation rate. The rate at which red blood cells settle to the bottom of a test tube, measured in millimeters per hour; a criterion of the activity of many diseases

spondylitis. Arthritis of the spine involving the many small joints, the ligaments, and fibrous structures of the spine, the sacroiliac joints are usually included

steroid hormones Hormones made synthetically, as well as normally manufactured in the body, molecular nucleus described as steroid

Still's disease. Rheumatoid arthritis occurring in children.

synovial fluid. A very viscous, mucinous fluid normally found within joints, altered in its amount, chemical and physical characteristics in the presence of certain connective tissue diseases; highly viscous material probably serving the function of lubrication and some unknown functions

synovium Connective tissue inside a joint, made up of cells, fiber elements, and ground substance, it is often called the lining membrane of the joint although it is not actually a membrane, site of joint inflammation in rheumatoid arthritis, material secreted by the synovium is called synovial fluid, normal fluid in joints

Taylor brace. A metal frame brace for the back.

tenosynovitis Inflammation of a tendon sheath (sleeve-like sheath in [illegible]

helpful in stiff neck or certain types of cervical arthritis.

ultrasonic therapy. The use of high-frequency sound waves as treatment; generally considered unproven as a means of treatment.

virus A submicroscopic organism, usually filtrable through very tiny filters, that can live and propagate itself only within body cells.

white blood cells. Certain cells of the blood of many different types, concerned with immune responses and the defense of the body.

efficient Only with much effort and training can its inefficiency be improved Even with gross mechanical defects and deformities, a patient can, with determination and tedious practice, master the ability to perform functions effectively that ordinarily would be done with little effort

These aids and appliances may be used in graduated steps as the patient progresses from bed to wheelchair, on to crutches, stair climbing, and finally independent walking The type of self-help apparatus thus changes with progress on the road to self sufficiency, self reliance, and independent living

The general policy of most clinics is to use self-help devices as little

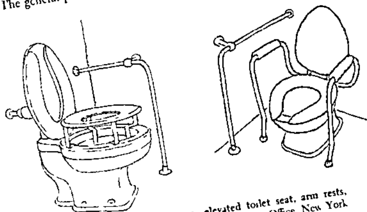


Figure 39 Self help devices elevated toilet seat, arm rests, and wall hand bar (Arthritis Self Help Device Office New York University–Bellevue Medical Center Institute of Physical Medicine & Rehabilitation

as possible However, if they are essential to increase function, to protect impaired joints, to allow a patient to walk get in and out of cars dress or feed himself, they are obviously indicated and welcomed by the patient

The following list is of places where information and catalogue pictures and instructions regarding self help devices may be obtaine

Figures 37, 38 and 39 show only some of the very commonly us self help devices There are hundreds more available for which indiv

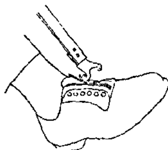


Figure 37. Self-help device which permits the patient to close zipper on shoes. (Arthritis Self Help Device Office, New York University–Bellevue Medical Center Institute of Physical Medicine & Rehabilitation.)

Figure 38. Self help devices: various ways in which a patient can handle silverware, a rubber cushion with back rest for the bath tub, a holder for various items such as a powder puff, toothbrush, and razor. (Arthritis Self Help Device Office, New York University–Bellevue Medical Center Institute of Physical Medicine & Rehabilitation.)

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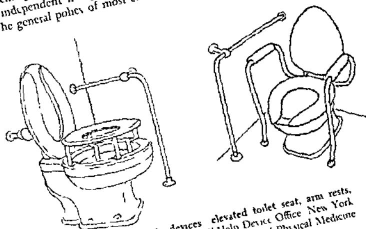


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ual need may exist Shown here are zippered shoe with a device to pull the zipper up, knife and fork adapted to use by a deformed hand and wrist, holder for various items such as a powder puff, extension device for various articles, e g., toothbrush, rubber cushion with back rest for bath tub (to prevent slipping), and an elevated toilet seat (making use much safer and easier with far less strain on muscles and joints getting up and down), and a hand bar on the wall

1 The Institute of Physical Medicine and Rehabilitation, New York University–Bellevue Medical Center, Self-Help Device Center, 400 East 34th Street, New York 16, New York
2 Fascole Corporation, 229 Fourth Avenue, New York 3, New York
3 Rehabilitation Equipment, Incorporated, 175 East 83rd Street, New York 28, New York
4 Macy's Department Store, Herald Square, New York City
5 Gimbel Brothers, Broadway at 33rd Street, New York City
6 Bloomingdale Brothers, Lexington Avenue at 59th Street, New York City
7 Scully Walton Company, 251 East 34 Street, New York 16, New York
8 Lewis & Conger, 1980 Northern Blvd, Manhasset, L I, N. Y
9 J A. Preston Corporation, 175 Fifth Avenue, New York City
10 Keefe & Keefe, Incorporated, 874 Lexington Avenue, New York City
11 Rehabilitation Services, Incorporated, 200 Court Street, Binghamton, New York

Appendix II

MAJOR ORGANIZATIONS DEVOTED TO EDUCATION, RESEARCH, AND TREATMENT

American Rheumatism Association
Mr Gerry Speyer, Executive Director
Room 1700
10 Columbus Circle
New York 19, N Y.

Arthritis and Rheumatism Foundation
10 Columbus Circle
New York 19, New York

National Institute of Arthritis and Metabolic Diseases
National Institutes of Health
Bethesda 4, Maryland

Canadian Arthritis and Rheumatism Society
National Office, 900 Yonge Street
Toronto 5, Ontario

The eight division offices of the Canadian Arthritis and Rheumatism Society are located at

645 West Broadway Avenue
Vancouver, British Columbia

Room 626, Civic Block
Edmonton, Alberta

304 Northern Crown Building
Saskatoon, Saskatchewan

King Edward Hospital
Morley Avenue
Winnipeg, Manitoba

328 Dupont Street
Toronto, Ontario

771 Burnside Street
Montreal, Quebec

60 Prince William Street
Saint John, New Brunswick

353 Bayers Street
Halifax, Nova Scotia

Appendix III contains a list of clinics with addresses, location, and type This list, compiled by the Arthritis and Rheumatism Foundation, is arranged alphabetically first, by state, next, by city, and, third, by name of the clinic or hospital within a particular city. An asterisk indicates that the status of the clinic is not known, and a letter of inquiry should be sent to those clinics when more detailed information is needed

Reviewing this list makes apparent the fact that practically all states have arthritis clinics—that progress has been and will continue to be made

Appendix III

CLINICS

THAT SPECIALIZE IN

THE TREATMENT OF ARTHRITIS

The clinics here listed are organized for the purpose of diagnosis and treatment of patients with arthritis on an outpatient basis They are staffed by medical personnel who are especially qualified in the rheumatic disease field Many are associated with hospitals, rheumatism research centers, and medical schools When hospital or institutional admission is necessary, such facilities are usually available *

Alabama

BIRMINGTON Jefferson Hillman Hospital, 619 South 19th Street Free and part pay clinic Restricted to residents of Jefferson County

* This list has been compiled by the Arthritis and Rheumatism Foundation As complete details as feasible have been included Those entries indicated by an asterisk contain incomplete data, if you are interested in additional information, you should write to the particular clinic

The eight division offices of the Canadian Arthritis and Rheumatism Society are located at:

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Vancouver, British Columbia

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Edmonton, Alberta

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Bir[illegible] Jefferson Hillman Hospital, 619 South 19th Street. Free. Restricted to residents of Jefferson County.

[illegible] Foundation [illegible] dicated by [illegible] al informa[illegible]

* As complete [illegible] incomp[illegible] an asterisk contain [illegible] tion, you should write to the particular [illegible]

Arizona

PHOENIX Arthritic Clinic, 1313 North 2nd Street

TUCSON Pima County Hospital Free clinic. Restricted to medically indigent residents of Pima County for at least one year.

Arkansas

HOT SPRINGS Leo N Levi Memorial Hospital, 320 Prospect Avenue No geographical restrictions

California

BERKELEY Herrick Memorial Hospital, 2001 Dwight Way Part pay clinic No geographical restrictions

FRESNO Fresno County General Hospital, 4475 East Ventura Avenue Free clinic Restricted to residents of Fresno County

LOS ANGELES Cedars of Lebanon Hospital, 4833 Fountain Avenue Free and part pay clinic No geographical restrictions.

Children's Hospital, 4614 Sunset Boulevard Free and part pay clinic Restricted to residents of Los Angeles County

Good Hope Clinic, 1241 Shatto Part pay clinic Restricted to [illegible]

of Los Angeles County

Methodist Hospital of Southern California, 2826 South Hope Street Pay clinic No geographical restrictions

Orthopedic Hospital, 2400 South Flower Street Free and part pay clinic No geographical restrictions

Wadsworth Veterans Administration, Veterans Administration Center Free for service-connected cases Charges for nonservice-connected disability cases For veterans only

White Memorial Hospital, 321 North Boyle Avenue Part pay clinic No geographical restrictions.

OAKLAND Highland Alameda County Hospital, 2701 14th Avenue Free clinic Restricted to Alameda County residents

PASADENA *Pasadena Dispensary, 38 Congress Street Part pay clinic* Restricted to residents of Pasadena, South Pasadena, Altadena, and San Marino

SAN DIEGO San Diego County General Hospital Free clinic Restricted *to residents of San Diego County*

SAN FRANCISCO Mt Zion Hospital, OPD, 1600 Divisadero Street Free clinic Restricted to residents of San Francisco

St Mary s Hospital 2200 Hayes Street Pay clinic No geographical restrictions

San Francisco Polyclinic, 1055 Pine Street Part pay clinic No geographical restrictions

Stanford University School of Medicine 2398 Sacramento Street Pay clinic No geographical restrictions

University of California Hospital, Third and Parnassus Avenues Free and part pay clinic No geographical restrictions

Veterans Administration Hospital, 42nd and Clement Streets Free to veterans (inpatients)

Veterans Administration Regional Office, 49 Fourth Street Free to veterans (outpatients)

SAN JOSE Santa Clara County Hospital, Los Gatos Road Free clinic Restricted to residents of Santa Clara County

SAN LEANDRO Fairmont Hospital of Alameda County 15400 Foothill Boulevard Free clinic Restricted to residents of lower Alameda County

SANTA BARBARA Santa Barbara General Hospital Part pay clinic Restricted to residents of Santa Barbara County

Colorado

DENVER University of Colorado Medical Center 4200 East 9th Avenue Free and part pay Restricted to residents of Colorado

Connecticut

BRIDGEPORT City Dispensary 835 Washington Avenue Part pay (50¢) No geographical restrictions

HARTFORD Hartford Dispensary, 59 Winthrop Street Restricted to indigent patients of Hartford County

Hartford Hospital, 80 Seymour Street Part pay clinic Referral by doctor through diagnostic clinic

McCook Memorial Hospital, 2 Holcomb Street Part pay clinic Restricted to residents of Greater Hartford

NEW HAVEN Grace-New Haven Community Hospital, 789 Howard Avenue Part pay Patients outside New Haven must be referred by doctor and pay maximum fee

Delaware

WILMINGTON Delaware Hospital, 14th and Washington Streets F and part pay No geographical restrictions

District of Columbia

George Washington University Hospital, 901 23rd Street, N.W. Part pay Restricted to Washington, D.C., and metropolitan area

Georgetown University Hospital, 3800 Reservoir Road Free and part pay Restricted to metropolitan area of District of Columbia, nearby Maryland, and Virginia

* Rheumatology Clinic, Mount Alto Hospital. For local veterans

* Walter Reed Hospital For the Army.

Florida

JACKSONVILLE Duval Medical Center Free clinic, Restricted to indigent patients of Duval County.

Georgia

ATLANTA * City Charity Hospital

Grady Memorial Hospital, 36 Butler Street Free clinic Restricted to residents of Fulton and DeKalb counties

* Lawson Veterans Hospital

Illinois

CHICAGO Central Free Dispensary at Presbyterian Hospital, 1748 W Harrison Street Free and part pay Limits 22nd Street on south, Canal Street on east, Fulton Street on north, and City Limits on west

Cook County Hospital, 1825 Harrison Street Free clinic Restricted to residents of Cook County

Grant Hospital of Chicago, 551 Grant Place, Free and part pay Restricted to residents north of Madison Street, Chicago

Mercy Hospital, 2537 Prairie Avenue Free and part pay No geographical restrictions

Michael Reese Hospital, Mandel Clinic, Free and part pay Restricted to indigent residents of Chicago

* Montgomery Ward Clinic, 747 North Fairbanks Court

Mount Sinai Hospital, 15th and California Free and part pay Restricted to residents of Chicago

Northwestern University Medical School Clinics, 303 East Chicago Avenue Free and part pay Restricted to residents of Chicago.

* Provident Hospital, 5034 South Vincennes
University of Chicago Clinics, 950 East 59th Street Part pay
No geographical restrictions
* University of Illinois Clinic, 1819 West Polk Street
* Veterans Administration Hospital 366 West Adams Street

Indiana

INDIANAPOLIS * Indianapolis General Hospital, 960 Locke Street

Louisiana

NEW ORLEANS Tulane Arthritis Clinic Hutchinson Memorial Building, Tulane Medical School 1430 Tulane Avenue Free clinic Limited to patients eligible for charity care

Maine

BANGOR Eastern Maine General Hospital, 498 State Street Free Clinic No geographical restriction
PORTLAND *Maine General Hospital 22 Arsenal Street
WATERVILLE * Thayer Hospital 214 Main Street

Maryland

ANNAPOLIS Anne Arundel General Hospital Free clinic Restricted to residents of Anne Arundel County
BALTIMORE Baltimore City Hospital 4540 Eastern Avenue Free and part pay
* Johns Hopkins University Hospital Broadway and Monument Street
Sinai Hospital, Monument and Rutland Streets Free and part pay
University of Maryland Redwood and Greene Streets Free clinic Restricted to residents of Baltimore
CAMBRIDGE Cambridge–Maryland Hospital Free clinic
CENTREVILLE Arthritis Clinic Free clinic Restricted to residents of Queen Anne's County
CHESTERTOWN Kent and Queen Anne Hospital Restricted to residents of Kent County
CHEVERLY Prince George's General Hospital Free clinic No geographical restrictions
CUMBERLAND Memorial Hospital Part pay clinic No geographic restrictions

ELKTON Union Hospital. Free clinic No geographical restrictions

ELLICOTT CITY Howard County Health Department Free clinic. No geographical restrictions

FREDERICK· Frederick County Health Department, 12 East Church Street Free clinic Restricted to residents of Frederick County.

HAVRE DE GRACE Harford County Health Department Free clinic. Restricted to residents of Harford County.

LEONARDTOWN * Dr. Alan D. House, Deputy State Health Officer, St Mary's County

OAKLAND * Dr Thomas B Dunne, Deputy State Health Officer, Garrett County

POCOMOKE CITY * Dr F S Waesche, Deputy State Health Officer, Worcester County

SALISBURY Wicomico County Health Department Free clinic No geographical restrictions

WESTMINSTER * Dr W Rose Cameron, County Health Officer, Carroll County

Massachusetts

BOSTON Beth Israel Hospital, 330 Brookline Avenue Full pay, part pay, and free No geographical restrictions

Boston Dispensary, 25 Bennet Street Free and part pay No geographical restrictions

Carney Hospital, South Boston Part pay clinic No geographical restrictions

House of the Good Samaritan, 25 Binney Street Clinic is primarily for rheumatic fever.

Massachusetts General Hospital Part pay clinic No geographical restrictions

* New England Medical Center

Peter Bent Brigham Hospital, 721 Huntington Avenue Free and part pay clinic Free only to residents of Suffolk County

Robert B Brigham Hospital, 125 Parker Hill Avenue Free and part pay clinic Free only to residents of greater metropolitan Boston

BRIGHTON St. Elizabeth's Hospital, 736 Cambridge Street Part pay clinic No geographical restrictions

CAMBRIDGE * Holy Ghost Hospital.

HOLYOKE Skinner Clinic, Holyoke Hospital Free clinic No geographical restrictions

LYNN Lynn Hospital, 212 Boston Street Part pay clinic No geographical restrictions

PITTSFIELD Pittsfield General Hospital Part pay clinic No geographical restrictions

SPRINGFIELD The Springfield Hospital, 759 Chestnut Street Part pay clinic. Restricted to Agawam East Longmeadow, Longmeadow, Springfield, West Springfield, and Wilbraham

WORCESTER Memorial Hospital, Belmont Street Part pay clinic No geographical restrictions

Worcester City Hospital Free clinic Restricted to residents of Worcester

Michigan

ANN ARBOR University (of Michigan) Hospital 1313 Ann Street Part pay clinic No geographical restrictions, but must be referred to hospital by family physician

DETROIT * Detroit Receiving Hospital

The Grace Hospital Outpatient Department Part pay clinic Restricted to residents of metropolitan Detroit

Harper Hospital, 3825 Brush Street Part pay clinic Restricted to residents of metropolitan Detroit

Henry Ford Hospital Part pay clinic No geographical restrictions

* Mount Carmel Hospital

* Providence Hospital

Minnesota

MINNEAPOLIS University of Minnesota Clinics Free and part pay clinic No geographical limitations

Missouri

KANSAS CITY General Hospital #1, 24th and Cherry Streets Free and part pay clinic Limited to residents of Kansas City

ST LOUIS * Arthritis Clinic, Wall Building Private clinic.

Barnes Hospital, 600 South Kingshighway Free and part pay No geographical restrictions

Firmin Desloge Hospital, 1325 South Grand Boulevard Free and part pay Restricted to St Louis County for free patients—no restrictions for paying patients

Jewish Hospital, 216 South Kingshighway Free and part pay. No geographical restrictions

Saint Louis City Hospital, 1515 Lafayette Avenue Free for indigent individuals Restricted to residents of the city of St. Louis for one year

St Louis City Hospital, outpatient clinic, 1600 South 14th Street Free clinic Restricted to city residents

St Luke's Hospital, 5535 Delmar Boulevard Free and part pay *Restricted to residents of St Louis and St Louis County*

Nebraska

OMAHA Creighton University, 14th and Davenport Streets Free clinic No geographical restrictions

* Dr F Lowell Dunn, 737 Medical Arts Building

University of Nebraska Hospital, 42nd Street and Dewey Avenue Free clinic. Restricted to residents of the state of Nebraska

New Hampshire

HANOVER Mary Hitchcock Memorial Hospital Part pay clinic No geographical restrictions

MANCHESTER Elliot Hospital Part pay clinic No geographical restrictions

New Jersey

ATLANTIC CITY Atlantic City Hospital, 26 South Ohio Free clinic No geographical restrictions

HACKENSACK Hackensack Hospital, Hackensack Place Part pay clinic Restricted to residents of Bergen County

IRVINGTON * Irvington General Hospital, 832 Chancellor Avenue

JERSEY CITY * Jersey City Medical Center, 100 Clifton Place

MORRISTOWN All Souls Hospital Free clinic No geographical restrictions

Morristown Memorial Hospital Free clinic. No geographical restrictions

NEWARK Clara Maass Memorial Hospital, 16-12th Avenue Part pay clinic No geographical restrictions

Hospital of St Barnabas, 685 High Street, Part pay clinic No geographical restrictions

* Lutheran Memorial Hospital, 16-12th Avenue

Newark Beth Israel Hospital, 201 Lyons Avenue Free and part pay No geographical restrictions

* Presbyterian Hospital, 27 South 9th Street

Veterans Administration, Regional Office Free to veterans in New Jersey

ORANGE New Jersey Orthopedic Hospital 179 Lincoln Avenue Free and part pay No geographical restrictions

TRENTON, William McKinley Memorial Hospital Brunswick Avenue Free and part pay clinic No geographical restrictions

New Mexico

ALBUQUERQUE Arthritis Clinic, Community Health Center

Lovelace Clinic 4800 Gibson Pay clinic No geographical restrictions

TRUTH OR CONSEQUENCES * Carrie Tingley Hospital for Crippled Children

New York

ALBANY Albany Hospital New Scotland Avenue Part pay clinic No geographical restrictions

BUFFALO Buffalo Children's Hospital 219 Bryant Street Free and part pay No geographical restrictions

Buffalo General Hospital, 100 High Street Free and part pay clinic No geographical restrictions

Edward J Meyer Memorial Hospital, 462 Grider Street Free and part pay clinic Restricted to residents of Erie County, except by special approval

JAMAICA Mary Immaculate Hospital 152-11 89th Avenue Part pay clinic Geographical restrictions

Queens General Hospital 164th Street and Grand Central Parkway Free clinic Geographical restrictions

NEW YORK CITY—BOROUGH OF BRONX Fordham Hospital, Southern Boulevard Free clinic No geographical restrictions

Lincoln Hospital, Concord Avenue and 141st Street Free clinic Geographical restrictions

Montefiore Hospital, East Gunhill Road and Bainbridge Avenue Part pay Geographical restrictions

Morrisania City Hospital, Walton Avenue and 168th Street Free clinic Geographical restrictions

NEW YORK CITY—BOROUGH OF BROOKLYN Beth El Hospital, Linden

Boulevard and Rockaway Parkway Part pay clinic. Geographical restrictions

The Brooklyn Hospital, DeKalb Avenue and Ashland Place Part pay Geographical restrictions

Cumberland Hospital, Auburn Place Free clinic. Geographical restrictions

Greenpoint Hospital, Kingsland Avenue Free clinic. Geographical restrictions

Jewish Hospital of Brooklyn, 555 Prospect Place Part pay Geographical restrictions

Kings County Hospital, Open Division, 451 Clarkson Avenue Free clinic Geographical restrictions

Kings County Hospital, University Division, 451 Clarkson Avenue Free clinic Geographical restrictions

Long Island College Hospital, Henry Street Part pay Geographical restrictions

Maimonides Hospital (Israel Zion Division), 4802 Tenth Avenue Part pay clinic Geographical restrictions

St John's Episcopal Hospital, 480 Herkimer Street. Part pay clinic Geographical restrictions

NEW YORK CITY—BOROUGH OF MANHATTAN Bellevue Hospital, 1st Medical Division Free clinic Geographical restrictions

Bellevue Hospital 2nd Medical Division Free clinic Geographical restrictions

Bellevue Hospital, 3rd Medical Division Free clinic Geographical restrictions

Bellevue Hospital, 4th Medical Division Free clinic Geographical restrictions

Beth David Hospital, 144 East 90th Street Part pay clinic Geographical restrictions

Beth Israel Hospital, Stuyvesant Square East Part pay clinic Geographical restrictions

City Hospital (Welfare Island Dispensary), 80th Street and East End Avenue Free clinic. Geographical restrictions.

Edward Daniel Faulkner Clinic, Presbyterian Hospital, 622 West 168th Street Part pay clinic Geographical restrictions (none for paying patients)

Flower-Fifth Avenue Hospital, 105th Street and Fifth Avenue Part pay clinic Geographical restrictions

French Hospital, 524 West 30th Street Part pay clinic Geographical restrictions

Gouverneur Hospital, Gouverneur Square Free clinic Geographical restrictions

Hospital for Joint Diseases, 1919 Madison Avenue Part pay clinic Geographical restrictions

Hospital for Special Surgery, Franklin Delano Roosevelt Drive and 70th Street Part pay Geographical restrictions

Jewish Memorial Hospital, Broadway and 196th Street Part pay clinic Geographical restrictions

Knickerbocker Hospital, 70 Convent Avenue Part pay clinic Geographical restrictions

Lenox Hill Hospital 76th Street and Park Avenue Part pay clinic Geographical restrictions

Metropolitan Hospital (Welfare Island Dispensary) 80th Street and East End Avenue Free clinic Geographical restrictions

Mt Sinai Hospital, 100th Street and Fifth Avenue Part pay clinic Geographical restrictions

New York Hospital York Avenue and 70th Street Part pay clinic Geographical restrictions

New York Infirmary 321 East 15th Street Part pay clinic Geographical restrictions

New York Polyclinic Hospital, 345 West 50th Street Part pay clinic Geographical restrictions

Roosevelt Hospital, 59th Street and 9th Avenue Part pay clinic Geographical restrictions

St Clare's Hospital, 415 West 51st Street Part pay clinic Geographical restrictions

St Luke's Hospital Amsterdam Avenue and 113th Street Part pay clinic Geographical restrictions

Stuyvesant Polyclinic, 137 Second Avenue Part pay clinic No geographical restrictions

University Hospital, 303 East 20th Street Part pay clinic Geographical restrictions

NEW YORK CITY—BOROUGH OF STATEN ISLAND St Vincent's Hospital, Bard Avenue Part pay clinic Geographical restrictions

ROCHESTER Rochester General Hospital, 501 West Main Street Free and part pay No geographical restrictions

North Carolina

DURHAM * Duke Medical School

WINSTON SALEM * Bowman Gray Medical School, Wake Forest College

Ohio

AKRON City Hospital, 525 East Market Street. Free clinic Restricted to residents of Akron and Cuyahoga Falls

CINCINNATI Cincinnati General Hospital Free clinic Restricted to residents of Hamilton County

CLEVELAND City Hospital, 3395 Scranton Road Free and part pay. Restricted to residents of Cleveland

* Lakeside Hospital

Mt Sinai Hospital Free and part pay No geographical restrictions

St Luke's Hospital, 11311 Shaker Boulevard Free and part pay clinic Restricted to residents of Cuyahoga County

University Hospitals of Cleveland, 2065 Adelbert Road Part pay clinic Restricted to hospital's service area, unless referred by a physician

COLUMBUS Ohio State University Hospital Free clinic No geographical restrictions

YOUNGSTOWN St Elizabeth's Hospital, 1044 Belmont Avenue Free and part pay Restricted to residents of Mahoning, Trumbull, and Ashtabula counties

Oklahoma

OKLAHOMA CITY * Arthritis Clinic, 228 N W 13th Street

Bone and Joint Hospital Pay clinic No geographical restrictions

Oklahoma State University Hospital Free clinic Restricted to residents of the state of Oklahoma

University Hospital, University of Oklahoma 800 N E 13th Street Free clinic Restricted to indigent residents of Oklahoma

TULSA Hillcrest Medical Center 1653 East 12th Street Part pay No geographical restrictions

Hillcrest Memorial Hospital Part pay clinic Restricted to residents of northeastern Oklahoma

* St John s Hospital
* Tulsa County Medical Society Welfare Building

Oregon

PORTLAND Holladay Park Clinic 1132 N E Second Street Pay clinic (nominal fee) No geographical restrictions
University of Oregon Medical School Hospital, 3181 S W Marquam Hill Road Free clinic Restricted to residents of Multnomah County but other indigent patients taken on request
WHEELER Rinehart Clinic Free and part pay clinic No geographical restrictions

Pennsylvania

BRISTOL Bristol General Hospital Wilson Avenue and Pond Street Pay clinic No geographical restrictions but must be referred by physician
BRYN MAWR * Bryn Mawr Hospital, Bryn Mawr Avenue Free and part pay
DANVILLE * The George F Geisinger Memorial Hospital
DARBY Fitzgerald Mercy Hospital, Lansdowne Avenue Free and part pay clinic No geographical restrictions
HARRISBURG Harrisburg Hospital Free clinic Restricted to residents of Cumberland Perry and Dauphin counties
LANCASTER * Lancaster General Hospital
PHILADELPHIA * Abington Memorial Hospital
Albert Einstein Medical Center (South Division), 5th and Reed Streets Free clinic No geographical restrictions
* Children s Hospital, 1740 Bainbridge Street Free and part pay
* Germantown Hospital 600 East Wister Street Free and part pay clinic
* Graduate Hospital
Hahnemann Medical College Hospital 230 North Broad Street Free and part pay clinic No geographical restrictions
Hospital of the University of Pennsylvania 3400 Spruce Street Free and part pay clinic No geographical restrictions
Jefferson Hospital, 10th and Walnut Streets Part pay clinic No geographical restrictions
Jefferson Medical College Hospital 10th and Walnut Streets Free and part pay No geographical restrictions

* Jewish Hospital, York Road and Olney Avenue Free and part pay clinic.

* Mercy-Douglass Hospital, 50th Street and Woodland Avenue Free and part pay.

* Mt Sinai Hospital, 1429 South 5th Street Part pay clinic.

Pennsylvania Hospital, 8th and Spruce Streets Free and part pay No geographical restrictions

Philadelphia General Hospital, 34th Street and Curie Avenue. Free and part pay Restricted to residents of Philadelphia area

Presbyterian Hospital, 51 North 39th Street Free and part pay No geographical restrictions.

Temple University Hospital. Part pay clinic No geographical restrictions

* Women's Hospital, Preston and Parrish Streets Free and part pay clinic

PITTSBURGH * Allegheny General Hospital, 320 East North Avenue

Falk Clinic, University of Pittsburgh, 3601 Fifth Avenue Free and part pay No geographical restrictions.

Montefiore Hospital, 3459 Fifth Avenue Free and part pay *clinic Restricted to residents of Allegheny County*

St Margaret Memorial Hospital, 265-46th Street. Free and part pay clinic Restricted to residents of Allegheny County.

Shadyside Hospital, 5230 Center Avenue Free clinic. No geographical restrictions.

WILKES-BARRE Laurel Hospital, Laurel Run. Private clinic No geographical restrictions (Physical Medicine Rehabilitation Service)

Rhode Island

PROVIDENCE St Joseph's Hospital, Broad and Peace Streets Free and part pay No geographical restrictions

Tennessee

MEMPHIS *Campbell Clinic, Incorporated, 869 Madison Avenue* Ten-member partnership clinic Full pay No geographical restrictions.

Texas

DALLAS * Parkland Hospital, Oak Lawn and Maple Avenue.

* Southwestern Medical School, University of Texas

Texas Scottish Rite Hospital, 2201 Welborn. Free clinic. Admits only children from the state of Texas.

W B Carroll Clinic, 3701 Maple Avenue.

HOUSTON Southern Pacific Hospital, 2015 Thomas For railroad employees only

MARLIN The Buie Clinic and Buie-Allen Hospital, 229 Coleman Street. Part pay clinic No geographical restrictions

* Clinic in Mineral Wells

Torbett Clinic and Hospital, 401 Coleman Street Pay clinic No geographical restrictions

SAN ANTONIO * Robert B Green Memorial Hospital, 515 Morales Street

Vermont

BURLINGTON DeGoesbriand Memorial Hospital Free clinic

Mary Fletcher Hospital Free and part pay clinic No geographical restrictions

Virginia

RICHMOND Hospital Division Medical College of Virginia 1200 East Broad Street Free and part pay clinic No geographical restrictions

Washington

SEATTLE * Harborview County Hospital

King County Hospital, Department of Medicine University of Washington, 325 Ninth Avenue Free clinic Restricted to residents of King County, unless special referral is made

Wisconsin

MADISON University Hospitals The University of Wisconsin, 1300 University Avenue Part pay clinic No geographical restrictions —referral by physician

MILWAUKEE Milwaukee County Dispensary Free clinic Restricted to indigent residents of Milwaukee County

WOOD Veterans Administration Hospital Restricted to veterans of Wisconsin

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